

TAKE IT PERSONAL!

Prevention of substance use among adolescents and young adults with mild intellectual disability and borderline intellectual functioning



Esmée Schijven

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Prevention of substance use among adolescents and young adults with mild intellectual disability and borderline intellectual functioning

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CHAPTER

General introduction

1

Introduction

This thesis focuses on the theory and evidence base of a substance use intervention for individuals with mild intellectual disabilities or borderline intellectual functioning (MID-BIF). The intervention is different from existing programs in the sense that it is personality-targeted to meet specific individual needs. Individuals with MID-BIF and comorbid problems form a substantial high-risk target group, and interventions must be specially adapted to attune to the specific needs of these individuals. *Take it personal!* provides an intervention that helps these individuals deal with their risky substance use in line with their specific personality profile.

This introductory chapter provides background information about the main issues of this thesis. First, I describe the target group of individuals with MID-BIF and their substance use behavior. Second, I provide an overview of existing programs for substance use among this specific group. I discuss various studies in the field, as well as the effectiveness of the different interventions, and address the limitations of the existing interventions. Third, I describe why we developed a personality-based intervention and we describe the theory of personality profiles in relation to substance use. Subsequently, I summarize the aims, design, and content of *Take it personal!*. Finally, I review the methodological issues from the various studies that are presented in this thesis, followed by a general overview of the outline of the thesis.

Mild intellectual disabilities and borderline intellectual functioning

According to the DSM-5, intellectual disability involves problems with general mental abilities that affect functioning in two areas: 1) intellectual functioning and 2) adaptive functioning (American Psychiatric Association, 2013). Impaired intellectual functioning refers to difficulties with learning, problem-solving, and adaptability. Impaired adaptive functioning relates to activities in daily life, such as problems with communication and independent living. The severity of the intellectual disability is described in the DSM-5 in terms of mild, moderate, severe, and profound. Individuals with mild intellectual disabilities are defined by an approximate IQ range of 50-69, and it is assumed that they can live independently with minimum levels of support (American Psychiatric Association, 2013). Borderline intellectual functioning refers to a group of people with an approximate IQ between 70-85. The DSM-5 no longer classifies individuals based solely on IQ boundaries. In the new DSM, an IQ score must be interpreted in the context

of the person's difficulties with general mental abilities. The DSM-5 addresses those with borderline intellectual functioning as a V-code in the chapter 'Other problems that may be a cause for concern', it is up to the clinician to distinguish between MID and BIF (American Psychiatric Association, 2013). People with borderline intellectual functioning have similar problems in adaptive functioning. They face difficulties across all areas of ordinary life similar to the target group of people with mild intellectual disabilities (Baglio et al., 2014; Fujiura, 2003; Gigi et al., 2014; Hassiotis, Strydom, Hall, & Ali, 2008; Peltopuro, Ahonen, Kaartinen, Seppälää, & Närhi, 2014; Snell et al., 2009). For this reason, this thesis focuses on the target group of individuals with mild intellectual disabilities and borderline intellectual functioning.

Substance use among individuals with MID-BIF

Patterns of substance use in individuals with MID-BIF are similar to those without MID-BIF but these individuals are at increased risk of developing a substance use disorder (Van Duijvenbode & VanderNagel, 2019; Didden, VanDerNagel, Delforterie, Van Duijvenbode, 2020; Van Duijvenbode et al., 2015; VanDerNagel, Kiewik, Buitelaar, & de Jong, 2011). Alcohol is the most commonly used and misused substance, although the percentages of alcohol use are lower among individuals with MID-BIF (64%) than among individuals with average intelligence (77%) (Simpson, 2012; VanDerNagel et al., 2011). On the other hand, the prevalence of cannabis and other illicit drugs is higher among individuals with MID-BIF (15%) than among their nondisabled peers (5%) (Van Duijvenbode & VanDerNagel 2019). The prevalence of substance use disorders in this target group varies from 0.5% to 21% (Van Duijvenbode et al., 2015). However, these rates strongly depend on the sample specifics (Carroll Chapman & Wu, 2012). For example, Cooper and colleagues found that 1% of 1032 community-based adults with mild to profound ID in the UK were diagnosed with substance use disorder (Cooper, Smiley, Morrison, Williamson, & Allen, 2007). Another study conducted with a community sample in America found that 21% of 122 individuals with MID-BIF misused alcohol (McGillicuddy & Blane, 1999). Other studies showed that alcohol use over the past year and month was similar for individuals with and without MID-BIF (Maag, Irvin, Reid, & Vasa, 1994) or lower for adolescents with ID (Gress & Boss, 1996). When it comes to cannabis use, Kepper and colleagues (Kepper et al., 2011) found similar rates in lifetime prevalence between adolescents with ID and adolescents with average intelligence.

Studies conducted in adults with MID-BIF showed that their rates of substance use are similar to those reported for the general population. However, the consequences

of substance use are often more severe than those reported in the general population (Chapman & Wu, 2012; Cocco & Harper, 2002; McGillicuddy, 2006; To, Neiryck, Vanderplasschen, Vanheule, & Vandeveld, 2014; Van Duijvenbode & VanDerNagel, 2019). Specifically, substance use is supposed to have a more negative effect on both mental and physical health compared to nondisabled peers (Barret & Paschos, 2006; To, Neiryck, Vanderplasschen, Vanheule, & Vandeveld, 2014). The consequences of substance use by adolescents with MID-BIF are apparent in multiple domains. For instance, more often than in people without MID-BIF, substance use in people with MID-BIF causes loneliness, conflicts and relationship problems. They are more at-risk for paranoid behavior, psychosis, confusion, depression, and anxiety. People with MID-BIF who engage in substance use more often show behavioral problems like aggression, worsening of overall functioning, (extreme) passivity (especially with the use of cannabis), criminal activities, and are more likely to have financial problems (Didden, Embregts, Toorn, & Laarhoven, 2009; Taggart et al., 2006; Van Duijvenbode & VanDerNagel 2019). Finally, adolescents with MID-BIF are at a higher risk for developing a substance use disorder (Burgard et al., 2000; McGillicuddy, 2006; Taggart et al., 2006; Van Duijvenbode et al., 2015).

Risk factors for substance use among individuals with MID-BIF

The risk factors for substance use and misuse in people with MID-BIF have not been studied extensively. Based on the existing studies, individuals with MID-BIF are at higher risk for developing a substance use disorder (Van Duijvenbode et al., 2015). Other risk factors are psychiatric co-morbidity and forensic or severe behavioral problems (Van Duijvenbode et al., 2015). Future studies should focus on exploring specific risk factors for SUD in this population, including a focus on client characteristics (e.g., motives for SU, personality traits, coping skills, executive functioning), and social factors (e.g., living arrangements, employment, social environment, peer pressure). Individuals with average intelligence report different motives for substance use (Cooper, 1994; Kuntsche & Kuntsche, 2009). According to the Motivational model of alcohol use (Cox & Klinger, 1988), alcohol use serves different functions and is driven by different needs. Motives for alcohol use are considered crucial for the final drinking decisions (Cooper, 1994; Cox & Klinger, 1988; Kuntsche & Kuntsche, 2009). The Motivational model of alcohol use (Cox & Klinger, 1988) postulates that individuals drink to obtain favorable outcomes or to avoid negative consequences. In addition, individuals are motivated to drink alcohol

because of internal rewards, such as improvement of the state of mind, or because of external rewards, such as social approval or acceptance by others (Kuntsche, Knibbe, Gmel, & Engels, 2005; Kuntsche & Kuntsche, 2009). Four different motives for alcohol use have been identified (Cooper, 1994; Kuntsche & Kuntsche, 2009). Individuals who drink alcohol because of social motives mainly use alcohol at social events to confirm social relations or to enjoy social occasions (i.e., external, positive reinforcement) (Kuntsche & Kuntsche, 2009; Kuntsche, Le Mével, & Berson, 2016). Individuals who drink because of conformity motives drink alcohol to prevent (social) rejection and to be part of a group (i.e., external, negative reinforcement) (Kuntsche & Kuntsche, 2009; Kuntsche et al., 2016). Individuals who drink because of coping motives, use them to regulate their negative emotions and to deal with (emotional) problems (i.e., internal, negative reinforcement) (Kuntsche & Kuntsche, 2009; Kuntsche et al., 2016). Finally, individuals who drink because of enhancement motives, use them to create a positive mood or to have fun (i.e., internal, positive reinforcement) (Kuntsche & Kuntsche, 2009; Kuntsche et al., 2016). The Motivational Model was initially developed to explain alcohol use, but has also proven useful for understanding motivations for use of other substances (Cooper, 2015; Hecimovic, Barrett, Darredeau, & Stewart, 2014). This thesis investigated the relationship between the four motives for substance use among individuals with MID-BIF.

Personality is an essential construct for understanding adolescents' substance use and misuse. Two personality dimensions were previously found to predict problematic substance, namely, (1) an impulsive sensation seeking and (2) a behavioral inhibition (Conrod, Comea, & Maclean, 2006). The first category includes young sensation seekers and young people with low impulse control; the second refers to a neurotic personality involving more anxious and negative thinking. Within these two dimensions, four personality profiles have been distinguished that are at-risk of developing risky and problematic use: Sensation Seeking (SS), Impulsivity (IMP), Anxiety Sensitivity (AS), and Negative Thinking (NT) (Conrod, Comea, & Maclean, 2006). Each personality profile is associated with specific substance misuse patterns, maladaptive motives for use, and vulnerability to specific forms of comorbid psychopathology in adolescents (Conrod & Woicik, 2002; Comeau, Stewart, & Loba, 2001). Impulsivity relates to an increased risk of the early onset of alcohol and drug problems (Pulkkinen & Pitkänen, 1994). Sensation seekers drink more (Schall, Kemeny, & Maltzman, 1992), tend to drink to enhance euphoric (intoxicating) effects (Comeau, Stewart, & Loba, 2001), and are more at risk of adverse drinking outcomes (e.g., Shall, Kemeny, & Maltzman, 1992). Individuals who score high on anxiety sensitivity show increased levels of drinking (Stewart, Peterson &

Pihl, 1995), are more responsive to the anxiety-reducing effect of alcohol, and are more likely to use alcohol to cope with negative feelings (Comeau, Stewart, & Loba, 2001). Individuals with high levels of hopelessness often show depression specific motives for substance use (Blackwell, Conrod, & Hansen, 2002), usually to cope with negative feelings (Comeau, Stewart, & Loba, 2001; Conrod, Comea, & Maclean, 2006; Cooper, Frone, Russell, & Mudar, 1995; Malmberg et al., 2010). These profiles have been associated with risky substance use in the general population (Conrod, Comea, & Maclean, 2006; Lammers et al., 2017; Sher, Bartholow, & Wood, 2000; Woicik, Stewart, Phi, & Conrod, 2009). Our study (Poelen, Schijven, Otten, and Didden, 2017) showed that alcohol use among individuals with MID-BIF is highly associated with negative thinking, impulsivity, and sensation seeking personality profiles and that severe drug use in individuals with MID-BIF is highly associated with negative thinking and sensation-seeking. These findings are similar to those reported for individuals without MID-BIF (Poelen et al., 2017).

There is an urgent need to develop and/or adapt substance use interventions for this group. Information about the reasons why individuals with MID-BIF drink or use drugs can help in thinking about how to adapt existing interventions. Interventions should be adapted to the needs and characteristics of individuals with MID-BIF and should be targeted at risk factors for substance use.

Overview of studies that investigated interventions for substance use in individuals with MID-BIF

Substance use interventions are often less accessible to individuals with MID-BIF, because there are only a few existing especially developed for this target group or existing programs are poorly adapted to their cognitive level (Carroll Chapman & Wu, 2012; Didden, VanDerNagel, Delforterie, & van Duijvenbode, 2019; Kerr, Lawrence, Darbyshire, Middleton, & Fitzsimmons, 2013; van Duijvenbode et al., 2015; van Duijvenbode & VanDerNagel, 2019). Programs that have shown to be effective in individuals without intellectual disability need to be adapted to the needs and learning styles of individuals with MID-BIF (Cassiani-Miranda, Quintero-Gomez, & Burbano, 2019; Juberg, Røstad, & Søndena, 2017). In the last decade, an increasing number of studies have assessed the feasibility and effectiveness of prevention and intervention programs for SUD in MID-BIF (Didden, VanDerNagel, Delforterie, & van Duijvenbode, 2019). Eight studies have tested the effectiveness of interventions for substance use among individuals with MID-BIF, ranging in focus from education and prevention to pretreatment and treatment.

Education

One study investigated the effectiveness of an educational intervention (Forbat, 1999). In this intervention, participants were trained to increase their knowledge of alcohol (Forbat, 1999), results showed they knew more after the intervention about the negative consequences of drinking. In order to make a more optimal fit to the competences and needs of individuals with MID-BIF, pictograms were added for participants with limited reading skills and the content was modified for a shorter concentration span and easier comprehension.

Prevention

In four studies, preventive interventions were tested for individuals with MID-BIF and substance use (Kiewik, VanDerNagel, Kemna, Engels, & DeJong, 2015; Kiewik, VanDerNagel, Engels, & DeJong, 2017; McGillicuddy & Blane, 1999; Turhan, Onrust, Klooster, & Pieterse, 2017). Three interventions were designed for alcohol and tobacco use (Kiewik et al., 2015; Kiewik et al., 2017; Turhan et al., 2017). Only one study was designed for drug use (McGillicuddy & Blane, 1999). The extent to which adaptations were made to obtain an optimal fit with the target population was different in each intervention. McGillicuddy and colleagues (1999) adapted their intervention for preventing drug use by shortening the sessions, using familiar media, using short informative presentations, using role-plays to learn skills, and repeating key points. The study showed that knowledge increased after the intervention, but attitude and actual substance use did not. The study of Kiewik and colleagues (2015) adapted their intervention for prevention of tobacco use by showing only half of the video on smoking. They found that knowledge about smoking increased, and the intention to stop or start smoking declined. In another study by Kiewik and colleagues (2017), it was unclear whether and how the intervention for prevention of alcohol use was adapted to the unique needs of individuals with MID-BIF. Nevertheless, they did find that knowledge, attitude, and intention to stop did not change after the intervention. Finally, the study of Turhan and colleagues (2017) adapted the intervention to prevent alcohol use, by adjusting books to the reading skills and adding meetings for the parents. This study did not find significant effects. It is worth noting that none of these interventions was personalized.

Pre-treatment

Two studies evaluated pre-treatment interventions (Mendel & Hipkins, 2002; Frielink, Schuengel, Kroon, & Embregts, 2015), both of which aimed to increase motivation to

decrease their substance use. They did not test the actual effect on substance use. Mendel and Hipkinks (2002) adapted their intervention by using visual aids and visual scales, while Frielink and colleagues (2015) adapted their intervention by simplifying the language and adapting the intervention to the cognitive skills of the participants.

Treatment

Only two studies investigated the effectiveness of a treatment intervention for alcohol misuse (Kouimtsidis et al., 2019; Sakdalan, Kittner, & Judd, 2017). The study of Kouimtsidis and colleagues (2019) was a feasibility study; thus, the results need to be interpreted with caution. There were no marks of effectiveness, only feasibility was studied (Kouimtsidis et al., 2019). Another feasibility study of Sakdalan and colleagues (2017) was specially designed for the forensic population of individuals with MID-BIF and substance use disorder. In this study, all six participants showed an improvement in their confidence to stay clean in risk-related situations and in their readiness to change. Actual marks of substance use were not investigated.

In conclusion, interventions adapted to the needs and capabilities of individuals with MID-BIF and studies on effectiveness are still scarce. Similarly, a gap exists in the prevention and treatment of adolescents with MID-BIF and substance use. Existing programs show a decrease in knowledge about substances, and they have been found to have no significant effects on decreasing substance use (Kiewik, VanDerNagel, Kemna, Engels, & DeJong, 2015; Kiewik, VanDerNagel, Engels, & DeJong, 2017; McGillicuddy & Blane, 1999). Some of these programs were effective in decreasing individuals' motivation to stop substance use but not the actual use (Frielink, Schuengel, Kroon, & Embregts, 2015; Mendel & Hipkinks, 2002). Early intervention before the onset of substance use disorders is pivotal. In addition, it is necessary to develop preventive interventions that are adapted to the needs and capabilities of adolescents with MID-BIF (Kiewik, van der Nagel, Engels, & de Jong, 2017). Current programs aimed at decreasing problematic substance use are not individually tailored, so a different way of intervening is required for this target group.

Personalized intervention

Personality-based interventions aimed at decreasing substance use have found to be particularly effective in samples of nondisabled individuals (Castellanos & Conrod, 2006; Conrod, Castellanos, & Mackie, 2011; Conrod, Comea, & Maclean, 2006; Lammers et al., 2017). Edalati and colleagues (Edalati, Afzali, Castellanos-Ryan, & Conrod, 2019)

suggested that targeted approaches, such as targeting the four personality profiles likes discussed above (e.g. sensation seeking, impulsive behavior, anxiety sensitivity and negative thinking), maybe the most appropriate and beneficial substance use prevention strategies for high-risk groups. The MID-BIF population is such a high-risk target group and therefore, a personality-profile approach may be particularly beneficial for this complex population. Using this personality profile strategy, different preventive interventions for nondisabled adolescents showed significant intervention effects on alcohol use frequency (Conrod & Nikolaou, 2016; Conrod, 2016), alcohol use severity (Conrod, Castellanos, & Mackie, 2011), binge drinking (Lammers et al., 2017; Conrod, Comea, & Maclean, 2006; Conrod, Castellanos, & Mackie, 2008), and cannabis use (Mahu, Doucet, O'Leary-Barrett, & Conrod, 2015; Newton et al., 2018).

Take it personal!

This thesis concentrates on Take it personal!, an indicated preventive program that was based on the assumption that it is important to take into account the different personality profiles and motives in our understanding of substance use among young individuals. This intervention aims to increase the competencies of adolescents and young adults with MID-BIF to deal with their personality traits and associated motives for excessive and problematic substance use. The program explicitly targets adolescents with early-onset of substance use (Grant & Dawson, 1997; Hawkins et al., 1997) and personality risk profile for problematic substance use (e.g., Rutledge & Sher, 2001). For each personality profile, a separate intervention is developed to address sensation seeking, impulsive behavior, anxiety sensitivity, and negative thinking separately. Participants join the intervention with others with the same personality profile. The program is explained in greater detail in Chapters Three and Four.

Objectives and outline of this thesis

This thesis attempts to provide insight into indicated prevention for substance use among adolescents and young adults with MID-BIF and comorbid behavioral problems. Part 1 describes cross-sectional research of the theoretically relevant concepts targeted in the intervention. Part 2 describes the systematic development of the intervention and the test of effectiveness.

Table 1 *Overview of this thesis*

Part 1: Cross-sectional relations between motives for substance use, personality profiles, and substance use among individuals with MID-BIF.

Chapter 2 Personality dimensions and substance use in individuals with mild to borderline intellectual disabilities

Chapter 3 Substance use among individuals with a mild intellectual disability or borderline intellectual functioning in residential care: Examining the relationship between drinking motives and substance use.

Part 2: Development of Take it personal! and investigation of effectiveness.

Chapter 4 Take it personal!: Development and a pilot study of an indicated prevention program for substance use in adolescents and young adults with mild intellectual disabilities and borderline intellectual functioning.

Chapter 5 Evaluating a selective prevention programs for substance use and comorbid behavioral problems in adolescents with mild to borderline intellectual disabilities: Study protocol of a randomized controlled trial.

Chapter 6 Effectiveness of an indicated prevention program for substance use in individuals with mild intellectual disabilities, borderline intellectual functioning, and comorbid behavioral problems: Results of a quasi-experimental study.

CHAPTER

2

Personality dimensions and substance use in individuals with mild to borderline intellectual disabilities

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Abstract

Aims: The aim of this study was to examine the role of the personality dimensions anxiety sensitivity, negative thinking, impulsivity and sensation seeking (as assessed by the revised version of the Substance Use Risk Profile Scale; SURPS) in substance use in individuals with mild to borderline intellectual disabilities (MBID).

Method: We tested the relationship between level of ID and SURPS personality dimensions and the relationship between SURPS personality dimensions and severity of alcohol and drug use. Participants were 118 persons (mean age 20.5 years) with a mean IQ of 71.1 admitted to care facilities for persons with MBID and severe behavioral problems.

Results: We found no significant relationship between level of ID and the four personality dimensions. In addition, findings showed that individuals with lower levels of anxiety sensitivity, higher levels of negative thinking, impulsivity and sensation seeking showed more severe alcohol use. Individuals with higher levels of negative thinking and sensation seeking had more severe drug use.

Conclusions and implications: The SURPS personality dimensions identify persons at increased risk for substance use disorders and might be useful in developing selective substance use interventions for individuals with MBID.

Introduction

The use of alcohol and/or drugs has adverse health and social consequences and is globally one of the major risk factors for morbidity and mortality (United Nations, 2012; World Health Organization, 2014). Similar to individuals with average intelligence, substance use is common and develops as early among those with mild to borderline intellectual disabilities (MBID; Van Duijvenbode et al., 2015; VanDerNagel, Kiewik, Buitelaar, & de Jong, 2011a). Estimates of the prevalence of substance use disorder among individuals with MBID vary from 0.5 to 21% (Duijvenbode et al., 2015). These prevalence estimates highly depend on sample characteristics, but are particularly high among individuals with MBID and severe behavioral problems, offending behavior or psychiatric co-morbidity (Duijvenbode et al., 2015; Chaplin, Partsenidis, Samuriwo, Underwood & McCarthy, 2014). Compared to individuals with an average intelligence alcohol use and misuse seems to be lower in individuals with MBID, while the prevalence of use and misuse of cannabis and illicit drugs seems to be higher (VanDerNagel et al., 2011a). People with MBID have an IQ between 50 and 85 and limitations in their social adaptive skills (American Psychiatric Association, 2013). In this group, substance use has a more negative impact on both mental and physical health compared with nondisabled peers (Barret & Paschos, 2006; To, Neiryneck, Vanderplasschen, Vanheule & Vandeveld, 2014). The past decade has shown an increased attention for substance use interventions for people with MBID, although evidence of their effectiveness is still weak (Kerr, Lawrence, Darbyshire, Middleton & Fitzsimmons, 2013). In addition, risk factors for substance use (disorders) for individuals with MBID are understudied. One of the risk factors may be related to individual's personality dimension. In persons without MBID the four personality dimensions anxiety sensitivity, negative thinking, impulsivity and sensation seeking have convincingly been associated with substance use risk (e.g., Krank et al., 2011; Mackinnon, Kehayes, Clark, Sherry & Stewart, 2014; Malmberg et al., 2010; Woicik, Stewart, Phil & Conrod, 2009). It is unclear whether these personality dimensions can also be identified in individuals with MBID which would enable us to identify subgroups of individuals at increased risk for problematic substance use and which would be helpful to develop and adapt interventions to their specific needs. The aim of the present study was to examine the role of personality dimensions in the (severity of) substance use in individuals with MBID.

The above four personality dimensions are commonly assessed by the Substance Use Risk Profile Scale (SURPS; Woicik et al., 2009) which was developed in a community-based sample of adult substance users without MBID (Conrod, Pihl, Stewart & Dongier, 2000). Ample research shows that the SURPS personality dimensions are related to

various measures of substance use in adolescents (e.g., Krank et al., 2011; Malmberg et al., 2010; Woicik et al., 2009) and (young) adults (Hecimovic, Barrett, Darredeau, & Stewart, 2014; Mackinnon et al., 2014; Spriggs & Hides, 2015; Woicik et al., 2009) with average intelligence. The SURPS reflects the theoretical perspective that vulnerability to substance use (disorder) can be explained by a sensitivity to either negative or positive reinforcement processes that maintain substance use (Woicik et al., 2009). The dimensions anxiety sensitivity and negative thinking are mainly related to substance use maintained by negative reinforcement, that is substance use to cope with negative emotional states (Comeau, Stewart & Loba, 2001; Cooper, Frone, Russell & Mudar, 1995). However, the specific facets of the personality dimensions anxiety sensitivity and negative thinking determine the nature of negative reinforcement of substance use. Anxiety sensitivity is defined as the fear of symptoms of physical arousal and related to self-medication of anxious symptoms through the use of alcohol and/or drugs (Comeau et al., 2001; Conrod, Pihl & Vassileva, 1998; Woicik et al., 2009). Negative reinforcement related to negative thinking is characterized by substance use to relief negative affect (Hecimovic et al., 2014; Woicik et al., 2009). Negative thinking has been shown to be related to alcohol use (Krank et al., 2011; Mackinnon et al., 2014), problem drinking (Krank et al., 2011; Mackinnon et al., 2014), cannabis use (Krank et al., 2011) and hard drug use (i.e. opiates, stimulants and hallucinogens) (Conrod et al., 2000; Krank et al., 2011). The personality dimensions impulsivity and sensation seeking are associated with a vulnerability to positive reinforcement and positively rewarding effects of substances (Woicik et al., 2009). Sensation seeking, characterized by the desire for intense and novel experiences, is specifically linked with substance use to attain positive affect (Castellanos-Ryan, Rubia & Conrod, 2011; Woicik et al., 2009). Sensation seeking is associated with alcohol use (Janssen et al., 2014; Krank et al., 2011), drinking problems (Krank et al., 2011), cannabis use (Krank et al., 2011) and hard drug use (i.e. stimulants and hallucinogens; Krank et al., 2011). Impulsivity, finally, is defined as the inability to control behavior when faced with immediate (positive) reinforcement (Castellanos-Ryan et al., 2011) and has been shown to be related to alcohol use (Krank et al., 2011; Mackinnon et al., 2014), drinking problems (Krank et al., 2011; Mackinnon et al., 2014), alcohol dependence (Conrod et al., 2000), cannabis use (Krank et al., 2011) and hard drug use (i.e. stimulants, hallucinogens, cocaine; Krank et al., 2011).

In sum, the association between the SURPS personality dimensions and substance use in individuals with an average intelligence has been well established. Given the high prevalence of substance use among individuals with MBID – especially those with comorbid

behavioral and/or mental health problems – and its detrimental consequences there is a need for interventions developed on the basis of underlying risk factors like personality dimensions. The aim of this study is to examine the role of the SURPS personality dimensions in severity of substance use in individuals with MBID. Study participants vary in level of ID (i.e., mild ID IQ between 50-69 and borderline ID IQ between 70-85), therefore we will first explore the relation between level of ID and SURPS personality dimensions. Then, we will examine the relationship between SURPS personality dimensions and severity of substance use. We expect that the association between the SURPS personality dimensions and substance use in a sample of 118 individuals with MBID will be in line with that in research in individuals with an average intelligence. More specifically, we expect that individuals with MBID scoring high on the dimensions anxiety sensitivity, negative thinking, impulsivity and sensation seeking will have more severe alcohol use and drug use compared to those with low scores of these dimensions.

Method

Participants and procedure

Data were collected at three Dutch facilities for individuals with MBID and severe behavioral problems. The facilities offer care and treatment including sheltered living, educational and/or work and leisure activities. For the purpose of data collection, we used self-report questionnaires and information from case files of the participants. Self-reports were collected with a web application of an interactive questionnaire with pictograms and images on a tablet computer. Questions were read out loud by the researchers (e.g., trained university master students) and if necessary clarified with simple wording and short phrases or examples. The participants operated the touch screen. Case files were used to assess participants' IQ scores and psychiatric diagnosis. Informed consent was obtained from participants and in prevailing cases also from a parent or legal guardian or curator. They were orally and in writing informed about the aims of the study, and confidentiality was assured. Participants were excluded in case of severe psychological instability such as a psychotic episode. The study was approved by the institutional ethical committee.

The study sample consisted of 118 individuals with MBID. Their mean age was 20.5 years (range: 14-37; SD = 5.5), and 72% were males. Mean total IQ was 71.1 (range: 51-85; SD = 8.5), mean verbal IQ was 72.0 (range: 50-99; SD = 9.0) and mean performance IQ was 75.9 (range: 51-107; SD = 11.6). The majority (77%) of the participants were voluntary

admitted to the institution. Of the participants, 84% had one or more psychiatric diagnoses (DSM-IV). Most prevalent diagnoses were Pervasive Developmental Disorder (PDD; 31%), Attention Deficit Hyperactivity Disorder (ADHD; 26%), Attachment disorder (20%), Oppositional Defiant Disorder (ODD) and Conduct Disorder (CD) (17%).

Measures

Substance use

To measure lifetime and current alcohol and drugs use, we used the Substance Use and Misuse in Intellectual Disability - Questionnaire (SumID-Q; VanDerNagel et al., 2011b; Van Duijvenbode, Didden, Korzilius, Trentelman & Engels, 2013). Substances (i.e., alcohol, cannabis, ecstasy, heroin, cocaine, speed and magic mushrooms) are introduced with images and only if the participant is familiar with a substance further questions about its use are asked. Lifetime use was assessed with the item 'Have you ever used alcohol/cannabis/hard drugs?' Response options were: (1) 'no' and (2) 'yes' (Van der Nagel et al., 2011b; Van Duijvenbode et al., 2013). Current substance use was assessed with the item: 'Did you use alcohol/cannabis/hard drugs in the last month?' Response options were (1) 'no' and (2) 'yes' (Van der Nagel et al., 2011b; Van Duijvenbode et al., 2013).

Severity of substance use. Severity of alcohol use was assessed by the Alcohol Use Disorders Identification Test (AUDIT; Babor, Higgins-Biddle, Saunders & Monteiro, 2001) and severity of drug use by the Drug Use Disorders Identification Test (DUDIT; Bergman, Bergman, Palmstierna, & Schlyter, 2003), which are incorporated in the SumID-Q. The items relate to frequency and quantity of use, dependency and problems related to use. An example of an item is: 'How often did you regret drinking/drug use?' Response options range from (1) 'never' to (5) 'almost every day'. Each scale consisted of 10 items (Van der Nagel et al., 2011b). Total scale scores were calculated by summing the items. The AUDIT and DUDIT have been shown to be applicable to individuals with MBID (Van Duijvenbode, Didden, Korzilius, & Engels, 2016). In the current study, Cronbach's alpha for the AUDIT and DUDIT was .70 and .86, respectively.

Personality dimensions

The SURPS (Woicik et al., 2009) is a 23-item questionnaire assessing four personality dimensions: (a) anxiety sensitivity, (b) negative thinking, (c) impulsivity and (d) sensation seeking. Each item (see Table 2) could be scored on a 4-point Likert-type scale ranging from (1) 'strongly agree' to (4) 'strongly disagree'. Mean scores were calculated for each

of the four dimensions. To adapt the SURPS to people with MBID response options were complemented with pictograms of thumbs up and thumbs down. Additionally, for some items wording was simplified. The SURPS was pilot tested in a small sample of people with MBID prior to the present study.

Statistical analysis

We computed descriptive statistics of substance use (i.e., lifetime and current alcohol, cannabis and hard drug use and AUDIT and DUDIT scores) and the SURPS personality dimensions (i.e., anxiety sensitivity, negative thinking, sensation seeking and impulsivity). We tested differences in substance use between participants with mild ID (IQ score between 51-69) and participants with borderline ID (IQ score between 70-85) using chi-square tests and ANOVA. To examine the relationship between ID level and SURPS personality dimensions an ANOVA was conducted to test for differences in personality dimension scores between participants with IQ scores below 70 and participants with IQ score of 70 and above.

Before we tested the relationship between SURPS personality dimensions and severity of alcohol and drug use we examined the measurement model of the SURPS using confirmatory factor analyses in Mplus 7.2 (Muthén & Muthén 1998-2007; cf. Krank et al., 2011). The maximum likelihood (ML) estimator was used to estimate parameters in the model. The Chi-square and the p-value, the Comparative Fit Index (CFI; Bentler, 1989) and the Root Mean Square Error of Approximation (RMSEA; Steiger, 1990) were used to assess the goodness of fit of the model. RMSEA values of below .08 and CFI values of above .90 reflect an acceptable fit of the model to the data (Hu & Bentler, 1999).

In the next step, mean scores on the SURPS subscales were linked to severity of substance use (AUDIT and DUDIT) using multiple linear regression analyses in SPSS 21.0. In these models we entered age, sex, level of ID and the most prevalent psychiatric disorders in this sample (i.e. PDD, ADHD, Attachment disorder and ODD/CD) in the first step, and in the second step we entered all four SURPS dimensions in the model at the same time (cf. Krank et al., 2011; Newton et al., 2015). In this way, all effects are controlled for sex, age, level of ID, PDD, ADHD, Attachment disorder and ODD/CD and for the effects of the other personality dimensions. In addition, to test the interaction between level of ID and personality interaction terms for level of ID and anxiety sensitivity, negative thinking, impulsivity and sensation seeking were entered in the model in the third step.

Results

Descriptive statistics of substance use

The majority of the participants had ever used alcohol, and also lifetime use of cannabis and hard drugs was common (see Table 1). The average AUDIT score was 6.8 (SD = 7.2) and the average DUDIT score was 4.6 (SD = 7.3). There were no significant differences in lifetime and current substance use between participants with mild ID (IQ score 51-69) and those with borderline ID (IQ 70-85). Moreover, mean AUDIT and DUDIT scores were also not significantly different between participants with mild ID and those with borderline ID.

Table 1 *Descriptive statistics of substance use and personality dimensions*

	Mild ID (N=42)	Borderline ID (N=63)	Total (N=118)	Difference
Age	Mean (SD) 21.9 (5.6)	Mean (SD) 20.0 (5.5)	Mean (SD) 20.8 (5.6)	$F(1, 105) = 2.94, p = .09$
Sex	%	%	%	
Male	71	71	71	$\chi^2(1) = 0.00, p = 1.00$
Psychiatric diagnosis	%	%	%	
PDD	31	33	31	$\chi^2(1) = 0.07, p = .80$
ADHD	26	27	26	$\chi^2(1) = 0.01, p = .93$
Attachment disorder	21	21	20	$\chi^2(1) = 0.01, p = .92$
ODD/CD	19	18	17	$\chi^2(1) = 0.04, p = .84$
Lifetime use	%	%	%	
Lifetime alcohol use	93	89	89	$\chi^2(1) = 0.46, p = .50$
Lifetime cannabis use	55	65	59	$\chi^2(1) = 1.13, p = .29$
Lifetime hard drug use	41	48	42	$\chi^2(1) = 0.52, p = .47$
Current use	%	%	%	
Current alcohol use	52	56	54	$\chi^2(1) = 0.10, p = .75$
Current cannabis use	21	22	22	$\chi^2(1) = 0.01, p = .92$
Current hard drug use	10	11	11	$\chi^2(1) = 0.07, p = .80$
Severity of substance use	Mean (SD)	Mean (SD)	Mean (SD)	
AUDIT	7.8 (8.1)	6.1 (6.8)	6.8 (7.2)	$F(1, 105) = 1.39, p = .24$
DUDIT	5.3 (8.4)	4.5 (6.9)	4.8 (7.3)	$F(1, 105) = 0.29, p = .59$
Personality dimensions	Mean (SD)	Mean (SD)	Mean (SD)	
Anxiety sensitivity	2.37 (.72)	2.17 (.66)	2.25 (.69)	$F(1, 105) = 2.18, p = .14$
Negative thinking	2.00 (.78)	2.03 (.73)	2.02 (.75)	$F(1, 105) = 0.03, p = .86$
Impulsivity	2.70 (.61)	2.60 (.56)	2.64 (.58)	$F(1, 105) = 0.80, p = .37$
Sensation seeking	2.75 (.73)	2.75 (.70)	2.75 (.71)	$F(1, 105) = 0.00, p = .97$

Note. Mild ID IQ between 51-69; Borderline ID IQ between 70-85.

PDD: Pervasive Developmental Disorder; ADHD: Attention Deficit Hyperactivity Disorder; ODD: Oppositional Defiant Disorder; CD: Conduct Disorder; AUDIT: Alcohol Use Disorders Identification Test; DUDIT: Drug Use Disorders Identification Test

Relationship between ID level and personality dimensions

Table 1 shows means and standard deviations of the personality dimension scores for participants with mild ID and those with borderline ID. We explored the relationship between ID level and SURPS personality dimensions and found no significant effects of ID level on the four personality dimensions at the $p < .05$ level.

Relationship between personality dimensions and severity of substance use

To validate the hypothesized four-factor structure of the SURPS scale we first conducted confirmatory factor analyses before testing the relationship between personality dimensions and severity of substance use. The fit indices of the initial model showed acceptable fit to the data ($\chi^2(224, N=118) = 379.92, p < .001$; RMSEA=.076; CFI=.844), but factor loadings of three items (i.e., 'I would like to parachute' (loading .31), 'It would be fun to make trips in the wild' (loading .14) and 'I would like to learn how to drive a motorcycle' (loading .39) were problematic. These items did not have salient loadings on the respective factors (loadings $\leq .40$; cf. Krank et al., 2011). Consequently, these items were omitted from analyses and all other items were retained on the factor (cf. Krank et al., 2011). This resulted in a 20-item four-factor model as presented in Table 2. This model showed a good fit to the data $\chi^2(164, N=118) = 260.10, p < .001$; RMSEA=.069; CFI=.896. Factor loadings ranged from .41 to .89, implying that the items accurately measured the four factors of the SURPS. The subscales demonstrated acceptable to good internal consistency in our sample (Cronbach's alpha ranged from .60 to .91). These estimates are in line with estimates of internal consistency of the SURPS subscales in samples of individuals with an average intelligence (Krank et al., 2011; Malmberg et al., 2010; Newton et al., 2015). In general, a Cronbach's alpha of $\geq .70$ is recommended, but for scales containing less than 10 items, a Cronbach's alpha of $\geq .60$ is an acceptable indicator of internal consistency (Krank et al., 2011; Loewenthal, 1996).

The relationship between personality dimensions and severity of substance use was first explored with univariate correlations. Results of univariate correlations as depicted in Appendix A show that anxiety sensitivity was positively correlated with the DUDIT score, negative thinking was positively correlated with the DUDIT score, impulsivity was positively correlated to current alcohol use, and both AUDIT and DUDIT scores and sensation seeking were positively associated with current alcohol and hard drug use, AUDIT and DUDIT scores. In addition, anxiety sensitivity and negative thinking, anxiety sensitivity and impulsivity and sensation seeking and impulsivity were positively correlated. This

indicates that participants with higher levels of anxiety sensitivity were also likely to report higher levels of negative thinking and higher levels of impulsivity. Participants with higher levels of sensation seeking were also likely to report higher levels of impulsivity.

In addition, we tested the multivariate relationship between personality dimensions and severity of alcohol use and drug use (Table 3). For severity of alcohol use significant associations were found between anxiety sensitivity, negative thinking, impulsivity and sensation seeking and AUDIT score. For severity of drug use significant associations were found between negative thinking and sensation seeking and DUDIT score. Results indicate that participants with lower levels of anxiety sensitivity, higher levels of negative thinking, impulsivity and sensation seeking scored higher on severity of alcohol use. Moreover, participants with higher levels of negative thinking and sensation seeking scored higher on severity of drug use. Associations between anxiety sensitivity and impulsivity were not statistically significant. The relationship between personality dimensions and severity of alcohol and drug use was controlled for age, sex and psychiatric diagnosis, indicating that personality dimensions are predictive despite these factors.

Finally, in the multivariate model we additionally examined the interaction between level of ID and personality dimensions. Both for severity of alcohol use and severity of drug use interaction terms between level of ID and personality dimensions were not statistically significant ($\Delta R^2 = .02$ (n.s.) after inclusion of interaction terms for level of ID and anxiety sensitivity, negative thinking, impulsivity, sensation seeking in the model for severity of alcohol use and $\Delta R^2 = .01$ (n.s.) for severity of drug use).

Table 2 *Results of confirmatory factor analyses of the four-factor structure of the SURPS items and internal consistencies (N=118)*

	<i>Standardized factor loading</i>
<i>Anxiety sensitivity</i>	
It's frightening to feel dizzy	.51
It frightens me when I feel my heart beat change	.63
I get scared when I'm too nervous	.69
I get scared when I feel unusual body sensations	.75
It scares me when I'm unable to focus on a task	.57
<i>Internal consistencies (Cronbach's α)</i>	.77
<i>Negative thinking</i>	
I am content with my life (r)	.83
I am happy (r)	.82
I have faith that I will have a great future (r)	.84
I feel proud of my accomplishments (r)	.59
I feel that I'm a failure	.73
I feel pleasant (r)	.89
I am very enthusiastic about my future (r)	.70
<i>Internal consistencies (Cronbach's α)</i>	.91
<i>Impulsivity</i>	
I often don't think things through before I speak	.41
I often get in situations that I later regret	.65
I usually act without stopping to think	.73
Generally, I am impulsive (that means unrestrained and spontaneous)	.52
I often persuade others to get what I want	.43
<i>Internal consistencies (Cronbach's α)</i>	.68
<i>Sensation seeking</i>	
I enjoy new and exciting things, even if they are unusual	.57
I like experiences purely for the kick, even if they are illegal	.73
I like doing things that frighten me a little	.42
<i>Internal consistencies (Cronbach's α)</i>	.60

Note. (r) reversed coding

Table 3 Results of multiple regression analyses with SURPS personality dimensions and severity of alcohol and drugs use after accounting for the effects of age, sex, level of ID and psychiatric diagnosis (N=118)

	Severity of alcohol use			Severity of drug use		
	<i>B</i>	<i>SE B</i>	β	<i>B</i>	<i>SE B</i>	β
Anxiety sensitivity	-3.09	1.30	-.29*	-1.63	1.22	-.15
Negative thinking	2.61	1.01	.27*	4.19	.95	.42***
Impulsivity	3.18	1.43	.25*	1.50	1.35	.12
Sensation seeking	2.34	1.11	.23*	2.75	1.05	.26*

Note. Severity of alcohol use: $R^2 = .06$ for Step 1 (model with age, sex, level of ID, Pervasive Developmental Disorder (PDD), Attention Deficit Hyperactivity Disorder (ADHD), Attachment disorder and Oppositional Defiant Disorder (ODD)/Conduct Disorder (CD)); $\Delta R^2 = .21$ for Step 2 (model with age, sex, level of ID, PDD, ADHD, Attachment disorder, ODD/CD, anxiety sensitivity, negative thinking, impulsivity, sensation seeking). Severity of drug use: $R^2 = .17$ for Step 1 (model with age, sex, level of ID, PDD, ADHD, Attachment disorder, ODD/CD); $\Delta R^2 = .22$ for Step 2 (model with age, sex, level of ID, PDD, ADHD, Attachment disorder, ODD/CD, anxiety sensitivity, negative thinking, impulsivity, sensation seeking).

* $p < .05$, ** $p < .01$, *** $p < .001$.

Discussion

The aim of this study was to examine the role of the four SURPS personality dimensions in (severity of) substance use in a sample of individuals with MBID. First, results of our study show that personality dimensions were not different between individuals with mild ID and those with borderline ID (Table 1). Compared to mean SURPS personality dimension scores in studies in individuals without MBID (i.e., Castellanos-Ryan, O’Leary-Barrett, Sully & Conrod, 2013; Mackinnon et al., 2014; Malmberg et al., 2010; Newton et al., 2015), participants in our study seem to score higher on negative thinking, impulsivity and sensation seeking. In particular, mean scores on negative thinking and impulsivity seems to be relatively high in individuals in our sample. This indicates that in individuals with MBID the SURPS is sensitive to detect higher levels of personality dimensions.

Second, results of this study revealed that all four personality dimensions were to some extent associated with severity of substance use in this sample (Table 3). Specifically, higher levels of negative thinking and sensation seeking were associated with severity of both alcohol and drugs use. Anxiety sensitivity and impulsivity were solely related to severity of alcohol use and not to severity of drug use. The consistent role of negative thinking and sensation seeking is in line with outcomes of studies in individuals with an average intelligence (Conrod et al., 2000; Krank et al., 2011; Newton et al., 2015). In contrast to the theoretical prediction, anxiety sensitivity appeared to be protective of severity of alcohol use instead of a risk factor. Although this is in contrast to studies that have shown that anxiety sensitivity is a risk factor for substance use in individuals with

an average intelligence, it is in line with studies showing evidence that anxiety sensitivity is related to lower levels of alcohol use in individuals with an average intelligence (Krank et al., 2011; Malmberg et al., 2010). In addition, we did not find support for a relationship between anxiety sensitivity and severity of drug use, a finding that is in line with studies in individuals with an average intelligence (Krank et al., 2011; Malmberg et al., 2010; Spriggs & Hides, 2015). Moreover, the current study indicates that higher levels of impulsivity were related to severity of alcohol use. This finding is in line with studies providing evidence for the association between impulsivity and alcohol use in individuals with an average intelligence (e.g., Krank et al., 2011; Newton et al., 2015). Similar to our study, some studies in individuals with an average intelligence also failed to find an association between impulsivity and drugs use (mainly cannabis) (Krank et al., 2011; Malmberg et al., 2010; Spriggs & Hides, 2015). Additionally, our findings for the relationship between personality dimensions and severity of substance use were not moderated by level of ID, indicating that relations were similar for individuals with mild ID and borderline ID.

Our findings were generally in line with results from the body of literature of SURPS personality dimensions in individuals with an average intelligence, indicating that the SURPS has also good utility among individuals with MBID. The confirmatory factor analyses showed that three items hypothesized to load on sensation seeking had problematic loadings. These items were not included in the used four-factor model. The items refer to the activities parachuting, hiking and motorcycling and might be out of reach and might not fit within the lives of most people with MBID receiving care and treatment in facilities. These items are probably less appropriate in people with MBID than in people with average intelligence. Besides these three items the four-factor structure was supported in people with MBID.

Several limitations of this study should be taken into consideration. The sample of this study consisted of individuals with MBID and severe behavioral problems. All participants received care or treatment from a facility. Consequently, this sample is not representative for the population of individuals with MBID, but probably only for those in contact with a facility. Moreover, it should be noted that we used self-reports to assess participants' substance use. Though self-reports are commonly used in studies in the general population (e.g., Krank et al., 2011) and also in individuals with MBID (Van Duijvenbode et al., 2013), they might have introduced bias. In addition, participants were admitted to facilities where substance use is not allowed (except for alcohol use of residents of 18 years or older) which implies that our sample contains abstaining or

mildly using former heavy users. However, despite that caregivers monitor substance use and that the facility's policy discourages use, substance use by residents appears to be common according to our results. The study sample consisted mainly (84%) of individuals with one or more psychiatric diagnoses. Treatment for disorders might vary between facilities or between individuals and this might affect our results as psychiatric disorders are related to substance use and personality dimensions. For example psychopharmacological treatment might influence behavior, or even the expression of personality traits differently. In addition, our sample size was small and statistical power was limited. Therefore, it is recommended to test SURPS personality dimensions and associations with substance use in a larger sample of individuals with MBID.

Substance use is widespread among individuals with MBID and behavioral problems and it is related to negative consequences. There is an urgent need to develop and/or adapt substance use interventions for this group. In order to do so interventions should be adapted to the needs and characteristics of individuals with MBID and should be targeted at risk factors for substance use, such as personality dimensions among others. In addition, selective interventions may be considered, that is interventions targeted at individuals with certain risk factors. The SURPS personality dimensions have important clinical implications in this respect as the SURPS enables the identification of individuals at increased risk for substance use disorders. Selective interventions based on the SURPS aim at training competences to deal with specific personality dimensions and associated motives for substance use using motivational interviewing and cognitive behavioral therapy. This approach is based on the assumption that training personality-specific skills to improve management of personality risk will reduce the likelihood of substance use linked to the specific personality profile. Personality targeted interventions do not result in changes in personality, but they change the relationship between personality dimensions and substance use (Conrod et al., 2013). These interventions have been shown to be effective in the reduction of substance use and misuse in individuals with an average intelligence (Conrod, Castellanos & Strang, 2010; Conrod et al., 2013; Lammers et al., 2015) and might be promising as intervention strategy in people with MBID as well (Schijven, Engels, Kleinjan & Poelen, 2015). This study was the first to examine the SURPS personality dimensions in substance use in individuals with MBID. Results provide support for the utility of the SURPS personality dimensions and show initial evidence for the role of personality dimensions in substance use in this group.

Appendix A *Correlations of personality dimensions and substance use (N=118)*

	1	2	3	4	5	6	7	8
1. Anxiety sensitivity	-							
2. Negative thinking	.32**	-						
3. Impulsivity	.37**	.13	-					
4. Sensation seeking	.04	-.10	.44**	-				
5. Current alcohol use	-.05	-.01	.21*	.40**	-			
6. Current cannabis use	-.11	.09	.13	.21*	.16	-		
7. Current hard drug use	-.13	-.01	.07	.21*	.18	.56**	-	
8. AUDIT	-.07	.12	.27**	.31**	.37**	.35**	.24**	-
9. DUDIT	.10	.31**	.30**	.32*	.22*	.49**	.48**	.54**

Note. * $p < .05$, ** $p < .01$.

CHAPTER

3

Substance use among individuals with mild intellectual disability or borderline intellectual functioning in residential care: Examining the relationship between drinking motives and substance use

This chapter is published as:

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Abstract

Background: This study examined the relationship between substance use motives (i.e., social, conformity, coping and enhancement) and substance use in individuals with mild intellectual disability or borderline intellectual functioning (MID-BIF).

Method: Data were collected among 163 clients with MID-BIF using interactive questionnaires with visual cues on a tablet with a web application.

Results: Results show that social motives were positively related to frequency of alcohol use, while conformity, coping and enhancement motives were positively related to severity of alcohol use. Results for drug use show that social motives were positively related to frequency of cannabis and hard drug use and that conformity motives were negatively related to frequency of cannabis use. Coping motives were positively related to severity of drug use.

Conclusions: Insight in substance use motives should be used when adapting interventions, as it could contribute to the prevention and reduction of substance use disorders in individuals with MID-BIF.

Introduction

Individuals with mild intellectual disabilities or borderline intellectual functioning (MID-BIF; IQ between 50 and 85 and limitations in social adaptive skills; American Psychiatric Association, 2013) are using alcohol and drugs similar to their peers without MID-BIF (Poelen, Schijven, & Vermaes, 2015; van Duijvenbode et al., 2015). Substance use—especially the use of alcohol—is relatively common in this group and often coincides with psychological, social and/or financial problems (Didden, 2017). Compared to people without MID-BIF, people with MID-BIF have a higher risk for developing substance use disorders (Burgard, Donohue, Azrin, & Teichner, 2000; McGillicuddy, 2006; van Duijvenbode et al., 2015). Substance use disorders are determined based on criteria pertaining the amount of use, interpersonal or social problems, continued use despite risky consequences, and the advance of tolerance and withdrawal symptoms (APA, 2013). Particularly among people with MID-BIF in combination with behavioral problems, delinquent behavior or psychiatric comorbidity prevalence rates of substance use disorders are high (see e.g., Chaplin, Partsenidis, Samuriwo, Underwood, & McCarthy, 2014; van Duijvenbode et al., 2015).

Next to being adapted to the target group, treatment of substance use disorders in individuals with MID-BIF should be based on risk factors of substance use as well as on motives for substance use. According to the “Motivational model of alcohol use” (Cox & Klinger, 1988), alcohol use serves different functions and is driven by different needs. Motives for alcohol use are considered crucial for the final decision whether to drink or not (Cooper, 1994; Cox & Klinger, 1988; Kuntsche & Kuntsche, 2009), and therefore, it is essential to understand motives for substance use. According to Cox and Klinger (1988), the decision whether to drink or not is based on rational and emotional processes, since it depends on what (affective) changes someone expects. Obviously, direct and indirect effects of substance use play an important role in this expectation. Use of alcohol, for example, has a direct effect on the emotional state of individuals. However, alcohol can also have an indirect effect, for example, if drinking alcohol improves contact with peers through changes in someone’s social inhibition (Kuntsche & Cooper, 2010).

The “Motivational model of alcohol use” (Cox & Klinger, 1988) posits that individuals drink to obtain positive outcomes or to avoid negative consequences. In addition, they are motivated to drink alcohol because of internal rewards, such as improvement of the state of mind, or because of external rewards, such as social approval or acceptance by others (Kuntsche, Knibbe, Gmel, & Engels, 2005; Kuntsche & Kuntsche, 2009). Four different motives for alcohol use have been distinguished (Cooper, 1994; Kuntsche & Kuntsche, 2009). Individuals

with social motives use alcohol at social events in order to confirm social relations or to enjoy social occasions (i.e., external, positive reinforcement) (Kuntsche & Kuntsche, 2009; Kuntsche, Le Mével, & Berson, 2016). Individuals with conformity motives use substances to prevent (social) rejection and to be part of a group (i.e., external, negative reinforcement) (Kuntsche & Kuntsche, 2009; Kuntsche et al., 2016). Individuals with coping motives use substances to regulate their negative emotions and to deal with (emotional) problems (i.e., internal, negative reinforcement) (Kuntsche & Kuntsche, 2009; Kuntsche et al., 2016). Finally, individuals with enhancement motives use substances to create a positive mood or to have fun (i.e., internal, positive reinforcement) (Kuntsche & Kuntsche, 2009; Kuntsche et al., 2016).

Studies on the relationship between the four motives and alcohol use show that social motives are related to irregular and non-problematic use of alcohol (see e.g., Cooper, 1994; Mezquita, Stewart, & Ruipérez, 2010). The relationship between conformity motives and alcohol use is more ambiguous and seems to depend on the outcome measure, environmental factors, phase of alcohol use and age. For instance, some studies found a negative relationship between conformity motives and quantity of alcohol consumption, while others found a positive relationship between conformity motives and alcohol-related problems (Kuntsche, Knibbe, Engels, & Gmel, 2007; Kuntsche et al., 2005). In adolescents, conformity motives may be beneficial in a positive social context to connect with a group of friends, but may instigate a negative effect in a social context with friends who display risky behavior. In contrast, coping motives and conformity motives are associated with a risk for problematic alcohol use, such as heavy alcohol use and alcohol-related problems (Cooper, 1994; Mezquita et al., 2010; van der Zwaluw, Kuntsche, & Engels, 2011).

The four motives have not yet been studied in people with MID-BIF. In addition, only the motives of alcohol use were examined and motives for drug use have not been included in studies among individuals without MID-BIF. Since these people have a higher risk for problematic substance use and motives can be an important factor for prevention and treatment of substance use disorders, it is of importance to investigate the relationship between the motives and substance use in this target group.

Methods

Participants, setting and procedure

This study was conducted in eight residential settings located in different areas in the Netherlands that provide intramural care, education/work and recreation to people with MID-BIF and behavioral problems. Participants were 163 individuals with MID-BIF who

had used alcohol and/or drugs in the past. This was assessed using self-report. Data on 163 participants had been collected in two earlier studies. In the first study (see Poelen, Schijven, Otten, & Didden, 2017), 204 clients were approached spread over three care facilities. Fifty-eight individuals did not return the informed consent forms by their parents or legal representatives, 23 individuals were not included because they were not reaching inclusion criteria (like psychologically unstable, did not want willing to participate), and 17 participants were excluded from analyses as they had never used alcohol and/or drugs. Hence, from this study 106 (64%) participants were included for analyses in this study. The remaining 57 (35%) individuals participated in a study that evaluated the effectiveness of an intervention for problematic substance use (see Schijven, Engels, Kleinjan, & Poelen, 2015). All these participants had used alcohol and/or drugs before. Data were collected with interactive questionnaires with visual cues on a tablet with a web application. Questions were read out loud by trained researchers (i.e., university master students) and were clarified with a simple explanation or examples if necessary. In addition, case files were used to collect information about IQ and psychiatric diagnoses (DSM-IV-TR, DSM-5). Participants and, in prevailing cases, their parent(s) or legal representative had given written consent to participate in this research. They were informed both orally and in writing about the purpose of the study in which anonymity was assured. People with MID-BIF who were psychologically unstable, for example, because of a psychotic episode, were excluded. The study was approved by the Ethics Committee of the Faculty of Social Sciences of the Radboud University at Nijmegen (number: ECSW2015-0903-303).

The mean age of the participants was 18.9 years (range: 11–30; SD = 4.4), 73% were male ($n = 119$) and 27% were female ($n = 44$). The mean total IQ (measured with the WAIS or WISC) of the respondents was 71.6 (range: 52–85; SD = 7.8). Of the participants of whom information about total IQ scores was available, 37% ($n = 47$) had a mild intellectual disability (MID; IQ 50–70) and 63% ($n = 60$) had borderline intellectual functioning (BIF; IQ 70–85). Out of 163 participants, 55% had one or more DSM diagnose(s) of which pervasive developmental disorder (PDD; 23%), attention deficit hyperactivity disorder (ADHD; 23%), attachment disorders (14%) and oppositional-defiant disorder (ODD), and conduct disorder (CD) (14%) were the most common. In 22% ($n = 36$) of participants, their case files did not contain total IQ scores and information about psychiatric diagnoses, but all participants received care from a setting that is specifically targeted at care for people with MID-BIF.

Instruments

Substance use was measured with the Substance Use and Misuse in Intellectual Disability-Questionnaire (SumID-Q; VanDerNagel, Kiewik, Dijk, Jong, & Didden, 2011). This instrument provides opportunities for an open and friendly way to discuss the use of substances with people with MID-BIF. The SumID-Q is modular, and participants only need to answer follow-up questions about the substances that they are familiar with (VanDerNagel et al., 2011). In addition, the SumID-Q was adapted to the target group by simple phrasing and use of language among others. Current use of alcohol, cannabis and/or hard drug (in the Netherlands, the opium law distinguishes hard drugs from soft drugs. Hard drugs are defined as drugs with significant, unacceptable high risks for health while soft drugs are defined as drugs with a reduced risk. Examples of hard drugs are cocaine, ecstasy and heroine) of the participants was measured with the item: "Have you used ... during the past month?" (1) "yes" or (2) "no." Frequency of alcohol, cannabis and/or hard drug use was measured with the item: "How often do you use?" (1) "never" to (6) "almost every day." Problematic substance use was measured with the Alcohol Use Disorder Identification Test (AUDIT; Babor, Higgins-Biddle, Saunders, & Monteiro, 2001) and the Drug Use Disorders Identification Test (DUDIT; Berman, Bergman, Palmstierna, & Schlyter, 2003). The two questionnaires each consist of ten items concerning the frequency and amount of use, symptoms of dependency and problems related to the use of substances. An example item is "How often were you in need of alcohol/drugs in the morning after having a severe amount of alcohol/drugs on the previous night?" The items were answered on a five-point scale ranging from (1) "never" to (5) "almost every day." The total scale score was calculated by averaging the item scores. In addition, participants with a score of 8 or higher on the AUDIT were categorized as "problematic drinker" and participants with a score of 5 or higher on the DUDIT were categorized as "problematic user." These cut-off points are determined on the basis of research in people without MID-BIF (Babor et al., 2001; Berman et al., 2003). The items of the AUDIT and the DUDIT have been shown to be applicable in people with MID-BIF (van Duijvenbode, Didden, Korzilius, & Engels, 2016). In the present study, the Cronbach's alpha for the AUDIT and the DUDIT was 0.70 and 0.86, respectively.

Motives for alcohol use were measured with the Drinking Motive Questionnaire Revised Short Form (DMQ-R-SF; Kuntsche & Kuntsche, 2009). This questionnaire consists of 12 items and measures the four motives for alcohol use (i.e., "social," "conformity," "coping" and "enhancement" motives), by means of the question: "Why do you drink alcohol?". Example items are Because it makes me feel happy and because it helps me when I feel

bad. Items were answered on a three-point scale (1) never, (2) sometimes and (3) almost always. The motives for drug use were determined using the DMQ-R-SF, with similar questions but then referring to the use of drugs (i.e., "Why do you use drugs?"). The items relating to drug use were completed by participants who used hard drugs and not by the respondents that only use cannabis. Cronbach's alpha's for motives for alcohol use were between 0.64 and 0.86; for drug use, they were between 0.77 and 0.89.

Statistical analyses

First, we performed descriptive analyses of substance use (current use, frequency of use and AUDIT/DUDIT scores) and motives for substance use (social, conformity, coping and enhancement). Before we tested the relationship between substance use motives and alcohol and drug use, we examined the measurement model of the motive items using confirmatory factor analyses in Mplus 7.2 (Muthén & Muthén, 1998–2012). The maximum likelihood (ML) estimator was used to estimate parameters in the model. The chi-square and the p-value, the Comparative Fit Index (CFI; Bentler, 1990) and the root mean square error of approximation (RMSEA; Steiger, 1990) were used to assess the goodness of fit of the model. RMSEA values of below 0.08 and CFI values of above 0.90 reflect an acceptable fit of the model to the data (Hu & Bentler, 1999). We examined differences in substance use between participants with mild intellectual disabilities (MID; IQ 50–70) and participants with borderline intellectual functioning (BIF; IQ 70–85), using chi-square tests and t tests. Pearson correlations were calculated to explore relationships between motives and substance use. In addition, multivariate linear regression analyses were conducted to examine multivariate relationships between motives and substance use. Multivariate linear regression analyses were conducted in SPSS 21 to examine multivariate relationships between motives and substance use.

Results

Descriptive statistics substance use

Of the participants, 62% currently used alcohol, 34% used cannabis and 20% used hard drugs (see Table 1). Of all participants, 23% (n = 38) used both alcohol and drugs in the last month. In total, 41% of the participants scored above the cut-off criterion for problematic use (score of 8 or higher) on the AUDIT, and 45% (n = 73) scored on the cut-off criterion for problematic use (score of 5 or higher) on the DUDIT. For both alcohol and drug use, 25% (n = 40) had a score above the cut-off point.

No significant differences were found in motives, current use, frequency of use and severity of use between participants with MID and participants with BIF (also see Table 1). There were no significant differences in age ($t(125) = 1.94, p = 0.054$) and sex ($\chi^2(1) = 0.08, p = 0.782$) between participants with MID and participants with BIF. The only significant difference between males and females was found for coping motives ($t(161) = -2.26, p = 0.025$) and enhancement motives ($t(161) = -2.19, p = 0.030$) on alcohol use. Females scored higher on both these motives than males. Other than that, there were no significant differences in motives, current use, frequency of use and severity of use between males and females (t test ranged between $t(161) = -2.22, p = 0.824$ and $t(161) = 0.91, p = 0.362$).

Table 1 *Descriptive statistics of substance use among people with mild intellectual disability or borderline intellectual functioning*

	MID (<i>n</i> =47)	BIF (<i>n</i> =80)	Total (<i>n</i> =163)	Difference
Current use	%	%	%	
Alcohol	63.8	62.5	62.0	$\chi^2(1) = 0.02, p = 0.881$
Cannabis	34.0	32.5	33.7	$\chi^2(1) = 0.03, p = 0.858$
Hard drug	21.3	18.8	20.2	$\chi^2(1) = 0.12, p = 0.730$
Frequency of use	Mean (<i>SD</i>)	Mean (<i>SD</i>)	Mean (<i>SD</i>)	
Alcohol	2.7 (1.0)	2.7 (1.0)	2.7 (1.0)	$t(125) = 0.53, p = 0.599$
Cannabis	1.7 (1.7)	2.0 (1.6)	2.0 (1.6)	$t(125) = -0.85, p = 0.395$
Hard drug	1.1 (1.5)	1.2 (1.3)	1.2 (1.4)	$t(125) = -0.42, p = 0.672$
Severity of use	Mean (<i>SD</i>)	Mean (<i>SD</i>)	Mean (<i>SD</i>)	
AUDIT	8.5 (8.3)	7.3 (6.3)	7.4 (6.8)	$t(125) = 0.94, p = 0.348$
DUDIT	6.7 (9.5)	6.6 (7.8)	6.9 (8.7)	$t(125) = 0.04, p = 0.965$
Motives for alcohol use				
Social	1.9 (.6)	2.0 (.5)	2.0 (.5)	$t(125) = -1.38, p = 0.170$
Conformity	1.3 (.5)	1.2 (.4)	1.2 (.4)	$t(125) = 1.04, p = 0.298$
Coping	1.6 (.7)	1.4 (.6)	1.5 (.6)	$t(125) = 1.70, p = 0.091$
Enhancement	1.8 (.7)	1.6 (.5)	1.6 (.5)	$t(125) = 1.34, p = 0.184$
Motives for drug use				
Social	1.8 (.7)	1.7 (.6)	1.6 (.6)	$t(68) = .79, p = 0.431$
Conformity	1.4 (.7)	1.3 (.5)	1.3 (.5)	$t(68) = .74, p = 0.460$
Coping	2.0 (.9)	1.8 (.7)	1.8 (.8)	$t(68) = 0.96, p = 0.337$
Enhancement	2.0 (.7)	1.9 (.7)	1.9 (.7)	$t(68) = .57, p = 0.572$

Note. MID = mild intellectual disability; BIF: borderline intellectual functioning.

The relationship between motives and substance use

We examined the measurement model of the four-factor structure of the motives items before testing the relationship between motives and substance use (Table 2).

Both models showed a good fit to the data ($\chi^2(48, N = 163) = 79.52, p < 0.01$; RMSEA = 0.063; CFI = 0.958 for drinking motives and $\chi^2(48, N = 90) = 65.88, p < 0.05$; RMSEA = 0.064; CFI = 0.975 for drug use motives). Factor loadings ranged from 0.41 to 0.92, implying that the items accurately measured the four factors of the motives subscales. The subscales demonstrated acceptable to good internal consistency in our sample (Cronbach's alpha ranged from 0.64 to 0.89). These estimates are in line with estimates of internal consistency of the motives subscales in samples of individuals with an average intelligence. In general, a Cronbach's alpha of ≥ 0.70 is recommended, but for scales containing less than 10 items, a Cronbach's alpha of ≥ 0.60 is an acceptable indicator of internal consistency (Krank et al., 2011; Loewenthal, 1996).

Table 3 shows that coping and enhancement motives are strongly positively correlated ($r = 0.69$ for alcohol and $r = 0.81$ for drug use). All other motives are positively related to the frequency of alcohol use and drug use and AUDIT and DUDIT scores.

In a third step, we examined the relationships between motives and substance use with a multivariate regression model. Results show that participants with a higher score on social motives have a higher frequency of use of substances. Relationships between the other motives and frequency of alcohol use were not significant (Table 4). In addition, participants who scored higher on conformity, coping and enhancement motives have a more severe degree of alcohol use than people with MID-BIF who scored lower on these motives. Social motives were not significantly related to the severity of alcohol use.

Table 5 shows the results for the relationship between motives for drug use and frequency of cannabis and hard drug use and the severity of drug use. Results show a positive relationship between the social motives and the frequency of cannabis and hard drug use. Participants, who have a higher score on the social motives, use more frequently cannabis and hard drug in comparison with individuals with MID-BIF that have a lower score on the social motives. In addition, we found a negative relationship between conformity motives and frequency of cannabis use, indicating that participants with lower scores on conformity motives use cannabis more often than participants with higher scores. No significant relationships were found between other motives and frequency of cannabis and hard drug use. For severity of drug use, we found that coping motives have a significant relationship to severity of use. People with MID-BIF who score higher on coping motives exhibit a more serious degree of use than people with MID-BIF who score lower on coping motives. The relationship between the other motives and severity of drug use was not significant.

Table 2 *Standardized factor loadings of the four-factor structure of the motives items and internal consistencies*

In the last 12 months, how often did you drink....	Alcohol use (n=163)	Drug use (n=90)
<i>Social motives</i>		
to celebrate a special occasion?	.41	.67
because it makes social gatherings more fun?	.70	.82
because it helps you enjoy a party?	.72	.68
Internal consistency (Cronbach's alpha)	.63	.76
<i>Conformity motives</i>		
so you won't feel left out?	.72	.87
to be liked?	.63	.83
to fit in with a group you like?	.79	.81
Internal consistency (Cronbach's alpha)	.74	.87
<i>Coping motives</i>		
to forget about your problems?	.84	.86
because it helps you when you feel depressed or nervous?	.89	.92
to cheer up when you're in a bad mood?	.75	.82
Internal consistency (Cronbach's alpha)	.86	.89
<i>Enhancement motives</i>		
because it's fun?	.69	.88
because it's exciting?	.67	.78
because you like the feeling?	.81	.89
Internal consistency (Cronbach's alpha)	.76	.88

Note. All factor loadings are significant at $p < 0.001$.

Table 3 *Correlations between the four motives and severity of substance use*

	1.	2.	3.	4.	5.	6.
1. Social	-	.52**	.45**	.62**	.36** ^c /.40** ^h	.41**
2. Conformity	.21**	-	.53**	.58**	.08 ^c /.26* ^h	.47**
3. Coping	.31**	.43**	-	.81**	.31** ^c /.37** ^h	.63**
4. Enhancement	.51**	.44**	.69**	-	.33** ^c /.37** ^h	.59**
5. Frequency alcohol/drug	.33**	.23**	.23**	.26**	-	.62** ^c /.74** ^h
6. AUDIT/DUDIT	.25**	.37**	.50**	.49**	.54**	-

Note. * $p < .05$, ** $p < .01$, *** $p < .001$. Under the diagonal correlations for alcohol use are shown ($n = 163$), above the diagonal correlations for drug use are shown ($n = 90$); ^c correlation for cannabis use; ^h correlation for hard drug use.

Table 4 Multiple linear regression analysis for the relationship between motives and alcohol use

	Frequency alcohol use			Severity of alcohol use		
	<i>B</i>	<i>SE B</i>	β	<i>B</i>	<i>SE B</i>	β
Social	.51	.16	.28**	.22	.97	.02
Conformity	.33	.21	.13	2.58	1.26	.15*
Coping	.15	.17	.09	2.91	.99	.27**
Enhancement	-.01	.21	-.01	2.82	1.28	.23*

Note: frequency of alcohol use: $R^2 = 0.12$; Severity of alcohol use: $R^2 = 0.31$.

* $p < .05$, ** $p < .01$, *** $p < .001$.

Table 5 Multiple linear regression analysis for the relationship between motives and drug use

	Frequency cannabis			Frequency hard drug			Severity drug use		
	<i>B</i>	<i>SE B</i>	β	<i>B</i>	<i>SE B</i>	β	<i>B</i>	<i>SE B</i>	β
Social	.86	.32	.35**	.57	.25	.29*	1.24	1.65	.08
Conformity	-.77	.34	-.28*	-.07	.27	-.03	2.29	1.73	.14
Coping	.49	.33	.25	.37	.26	.24	5.22	1.69	.44**
Enhancement	.16	.40	.08	.03	.31	.02	1.29	2.01	.10

Note: frequency of cannabis use: $R^2 = 0.21$; frequency of hard drug use: $R^2 = 0.20$, Severity of drug use: $R^2 = 0.43$.

* $p < .05$, ** $p < .01$, *** $p < .001$.

Discussion

The aim of this study was to examine the relationship between substance use in individuals with MID-BIF and their motives for substance use. Regarding alcohol use, this study showed that only social motives were positively related to the frequency of alcohol consumption in people with MID-BIF. Other motives were not significantly related to frequency of alcohol use. These findings are in line with studies that show that social motives are related to non-problematic use of alcohol (Cooper, 1994; Mezquita et al., 2010). This finding is also in line with the fact that light alcohol use is socially accepted and goes hand in hand with healthy social relationships. In addition, we found that coping and enhancement motives were positively related to the severity of alcohol use. This is in line with studies showing that individuals who use coping and enhancement motives to drink are more likely to engage in risky and problematic alcohol use (Kuntsche et al., 2005). Conformity motives were also positively associated with severity of alcohol consumption for people with MID-BIF. Previous studies showed mixed findings when it comes to the conformity motives. A possible explanation for finding an effect for conformity motives in this sample is that people with MID-BIF want to belong to groups where the standard

is to use high levels of alcohol. In these groups, there may be more social pressure to use large amounts of alcohol, while the person's own intention is to not do that (Mezquita et al., 2010). In individuals with MID-BIF, motives for drug use have not yet been studied in the same way and with a similar scale as motives for alcohol use. In line with the findings for frequency of alcohol use, this study showed that social motives are positively related to the frequency of cannabis and hard drug use in people with a MID-BIF. In contrast to the findings for the frequency of alcohol use, conformity motives were negatively related to frequency of cannabis use. People with MID-BIF who wish to conform to group norms are less likely to use cannabis. Regarding severity of drug use, coping motives were related to more severe degrees of drug use. Unlike our findings for severity of alcohol use, conformity and enhancement motives were not related to severity of drug use. The results of this study need to be interpreted in the light of a number of limitations. First, we only included people with MID-BIF and behavior problems and all respondents received care from a residential facility. As a result, this sample is not representative for the population of people with MID-BIF. We recommend to test the relationship between substance use and motives for substance use in a sample of people with MID-BIF who do not have severe behavioral and psychiatric problems. Second, the current study only used self-report, which may cause inadequate report of substance use (mostly under-report or, to a lesser extent, over-report) (see VanDerNagel et al., 2017). People with MID-BIF have a strong tendency to agree with the proposed answers (so-called acquiescence), especially when it comes to taboo topics, such as alcohol or drug use (VanDerNagel et al., 2017). This tendency is strengthened when questions are asked directly, which is the case in an interview or when completing a questionnaire. Most questionnaires (such as the AUDIT/DUDIT) require a certain level of knowledge of substances and a conceptual level of understanding. By developing the SumID-Q, these limitations were taken into account. The reasonably good agreements between self-report with the SumID-Q and biomarker data show that the SumID-Q generates valid data to measure substance use in people with MID-BIF (see VanDerNagel et al., 2017). Results of the AUDIT and DUDIT show that almost half of the participants showed problematic substance use. However, cut-off points of both instruments are based on standards for people without MID-BIF (Babor et al., 2001; Berman et al., 2003), and despite the fact that the AUDIT and DUDIT have shown to be applicable to people with MID-BIF (van Duijvenbode et al., 2016), "cut-off points" for problematic use may be lower for people with MID-BIF. The results of this study stress the importance for including motives into personalized interventions for people with MID-BIF and substance use instead of using an "one-size fits all" approach. The intervention "Take it personal!" (Schijven, VanDerNagel, Lammers, & Poelen, 2014) is

an example of a personalized intervention which includes personality traits and motives for substance use to connect better to the individual needs of the person. It is necessary to test whether a personalized intervention such as "Take it personal!" is more effective than an intervention which is not based on the person's personality traits and motives for substance use. In sum, it can be concluded that both coping and enhancement motives pose a risk for problematic use of alcohol in people with MID-BIF. For problematic drug use, coping motives are most dominant. This insight can contribute to prevention efforts or reduction of problematic substance use in people with MID-BIF and has implications for both policies in clinical practice and for interventions for prevention and treatment in substance use. Our results show that many people with MID-BIF in residential care are at risk for problematic substance use. Therefore, care facilities are advised to develop strict and transparent policies focusing on substance use. Moreover, it is highly important that training of staff is facilitated as well as systematic screening, diagnostics, prevention and treatment with the focus on substance use (van Duijvenbode et al., 2015). Staff members and clinicians are advised to adapt their approach to the motives for substance use. For instance, a person with the social conformity motives can be helped to become stronger in making own decisions. Instruments such as the SumID-Q or DMQ-R-SF can be supportive for screening and diagnostics. Screening of motives for substance use provides a starting point for personalized and effective prevention and treatment. A person with coping motives, for instance, may benefit most optimally from an intervention that is based on cognitive-behavioral strategies aimed at learning how to cope effectively with anxiety or negative thoughts, whereas an individual who scores high on conformity motives may benefit most likely from a social skills training (Mezquita et al., 2010). With a personalized approach of prevention and treatment, the (potentially) harmful effects of substance use disorders can be prevented.

CHAPTER

4

Evaluating a selective prevention program for substance use and comorbid behavioral problems in adolescents with mild to borderline intellectual disabilities: Study protocol of a randomized controlled trial

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Abstract

Background: Substance use and abuse is a growing problem among adolescents with mild to borderline intellectual disabilities (ID). Substance use patterns in general population are similar to patterns among non-disabled peers, but substance use has more negative consequences for adolescents with mild to borderline ID, and they are at an increased risk for developing a substance use disorder. Nevertheless, effective and evidence based prevention programs for this groups are lacking. The study described in this protocol tested the effectiveness of a selective intervention aimed at reducing substance use in adolescents with mild to borderline ID and behavioral problems. In the intervention, participants acquire competences to deal with their high-risk personality traits.

Methods: A randomized controlled trial will be conducted among 14-21-year old adolescents with mild to borderline ID and behavioral problems admitted to treatment facilities in the Netherlands. Inclusion criteria are previous substance use and personality risk for substance use. Participants will be individually randomized to the intervention (n = 70) or control (n = 70) groups. The intervention group will be exposed to six individual sessions and five group sessions carried out by two qualified trainers over six-week period. Primary outcomes will be the percentage reduction in substance use (for alcohol: percentage decrease of binge drinking, weekly use and problematic use, for cannabis: the percentage decrease of lifetime cannabis use and weekly use and for hard drug: the percentage decrease of lifetime use). Secondary outcomes will be motives for substance use, intention to use, and internalizing and externalizing behavioral problems. All outcome measures will be assessed after two, six, and twelve months after the intervention.

Discussion: This study protocol describes the design of an effectiveness study of a selective prevention program for substance use in adolescents with mild to borderline ID and behavioral problems. We expect a significant reduction in alcohol, cannabis and hard drug use among adolescents in the intervention group compared with the control group.

Background

Substance use and abuse is a problem among adolescents and young adults with mild to borderline intellectual disabilities (ID), and both scientists as practitioners report increasingly number of concerns about this subject (Barrot & Pachos, 2006; McGillicuddy, 2006; McGillivray & Moore, 2001; Taggart, McLaughlin, Quinn & Milligan, 2006). The results of an explorative study in the Netherlands showed that 75 %-85 % of adolescents with mild to borderline ID and severe behavioral problems who are admitted to treatment facilities show lifetime alcohol use or use of alcohol on a regular basis. Moreover, 25 %-50 % of the described target group uses drugs (in particular cannabis) occasionally or regularly. For most cannabis users, cannabis is a part of their daily habit (Bransen, Schipper & Blekman, 2009; Steenhuis & van der Poel, 2009). Although patterns of cannabis use are quite similar to substance use patterns among non-disabled peers, this is of great concern because substance use and misuse have more negative consequences (Barrot & Pachos, Bransen et al., 2009; To, Neiryck, Vanderplasschen, Vanheule & Vandervelde, 2014) for adolescents with mild to borderline ID. Substance use by these adolescents causes various problems, including social, mental and behavioral problems, criminal activities, and financial problems (Taggart et al., 2006). Adolescents are also at a higher risk for developing a substance use disorder (Steenhuis & van der Poel, 2009; VanderNagel et al., 2014; Burgard, Donohue, Azrin & Teichner, 2000) compared to their nondisabled peers. To limit these negative consequences, the development of prevention programs that are adjusted to the needs of adolescents with mild to borderline ID is necessary. However, currently well-fitting and evidence-based prevention programs for adolescents with mild to borderline ID and substance use are lacking (Lokman, Neijmeijer & Bransen, 2012; Lawrence, Kerr, Darbyshire & Middleton, 2009; Kerr, Lawrence, Darbyshire & Middleton, 2013).

Take it personal!

'Take it personal!' is a selective prevention program aimed at reducing substance use in adolescents with mild to borderline ID (Schijven, VanderNagel, Otten, Lammers & Poelen, 2021). The program is specifically developed for adolescents with mild to borderline ID who receive treatment for additional behavioral problems. It is a selective intervention targeting adolescent who initiated substance use and who have a personality risk for substances. 'Take it personal!' offers adolescents competences to deal with their personality traits and associated motives for excessive substance use. The program is based on an existing program for non-disabled peers that have been proven to be effective (Conrod, Comea & Maclean, 2006; Conrod, Castellanos-Ryan & Strang, 2010; Conrod, Castellanos-Ryan & Mackie, 2011; Lammers et al., 2011) and is based on the theory that personality is an

important construct for understanding adolescents' substance use and misuse (Conrod, Comea & Maclean, 2006). Four personality profiles are identified to be associated with substance use namely, Sensation Seeking (SS), Impulsivity (IMP), Anxiety Sensitivity (AS), and Negative Thinking (NT) (Conrod, Comea & Maclean, 2006). Each personality profile is associated with unique patterns of substance use, maladaptive motives for substance use, and comorbid psychopathology (Stewart & Devine, 2000; Stewart, Loughlin & Rhyno, 2001; Conrod & Woicik, 2002). Sensation seekers are more likely to be heavy drinkers and have greater risk for adverse drinking consequences (Conrod, Peterson & Pihl, 1997; Shall, Kemeny & Maltzman, 1992). Impulsivity is associated with increased risk for early onset of alcohol and drug problems (Pulkkinen & Pitkänen, 1994). The lack of ability to delay behavioral response in impulsive individuals (Spoont, 1992) is a risk factor for abuse of drugs due to a self-regulation deficit (Pihl & Peterson, 1995). Highly anxious sensitive persons showed increased levels of drinking (Stewart, Peterson & Phil, 1995; Stewart, Zvolensky & Eifer, 2001a) are more responsive to the anxiety-reducing effect of alcohol, are more likely to use alcohol to cope with negative feelings (Comeau, Stewart & Loba, 2001), and have a higher incidence of problem drinking symptoms (Conrod, Pihl & Vassileva, 1998). They often cope with their negative feelings by using a combination of withdrawal (from social situations), dependence (on others to make them feel better), or use of alcohol and/or drugs. Persons with high levels of hopelessness usually use alcohol and/or drugs to cope with negative feelings (Kerr et al., 2006; Comeau et al., 2001a; Cooper, Frone, Russell & Mudar, 1995; Malmberg et al., 2010). The intervention offers adolescents competences to deal with their personality traits and associated motives for substance use. Previous studies on interventions based on these personality profiles have demonstrated that this intervention is effective for adolescents with normal intelligence (Kerr et al., 2006; Conrod et al., 2006; Conrod et al., 2010; Conrod et al., 2011; Lammers et al., 2011). These personality profiles have not been applied in interventions targeting adolescents with mild and borderline ID, while they might be particularly relevant for this high-risk target group, as personality related substance use and psychopathology is highly prevalent in this population.

The intervention is based on the theoretical principles of motivational interviewing (MI) and cognitive behavioral therapy (CBT), the techniques that have been proven to be effective by decreasing alcohol and drug use among non-disabled adolescents (Kendall & Braswell, 1985; Reynolds, Wilson, Austin & Hooper, 2012; Seligman & Ollendick, 2011; Webb, Auerbach & Derubeis, 2012). Scientific evidence also shows that these techniques are effective for people with mild to borderline ID (Didden, Korzilius, Van Oorsouw & Sturmey, 2006; Riper et al., 2014; Vereenooghe & Langdon, 2013).

The intervention for adolescents with mild to borderline ID was developed according to the guidelines for effective interventions for people with mild ID (De Wit, Moonen &

Douma, 2011). We used simple information; offered concrete exercises and games; used more visual materials (like pictures), short sessions, and more sessions for repetition. Furthermore, we used techniques of psychomotor therapy. Psychomotor therapy is a common method used by adolescents with ID, and practitioners have good experiences in daily practice. This intervention will fill a gap in existing prevention programs for adolescents with mild to borderline ID.

Aims and hypotheses

The main aim of this study is to test the effectiveness of the intervention 'Take it personal!' in decreasing substance use among adolescents (age 14 – 21 years old) with mild to borderline ID and behavioral problems who are admitted to treatment facilities in the Netherlands. The effectiveness of the intervention is being assessed by conducting a randomized controlled trial (RCT) with two conditions (treatment and control group). Follow-up assessments will be carried out at two, six, and twelve months after the start of the intervention.

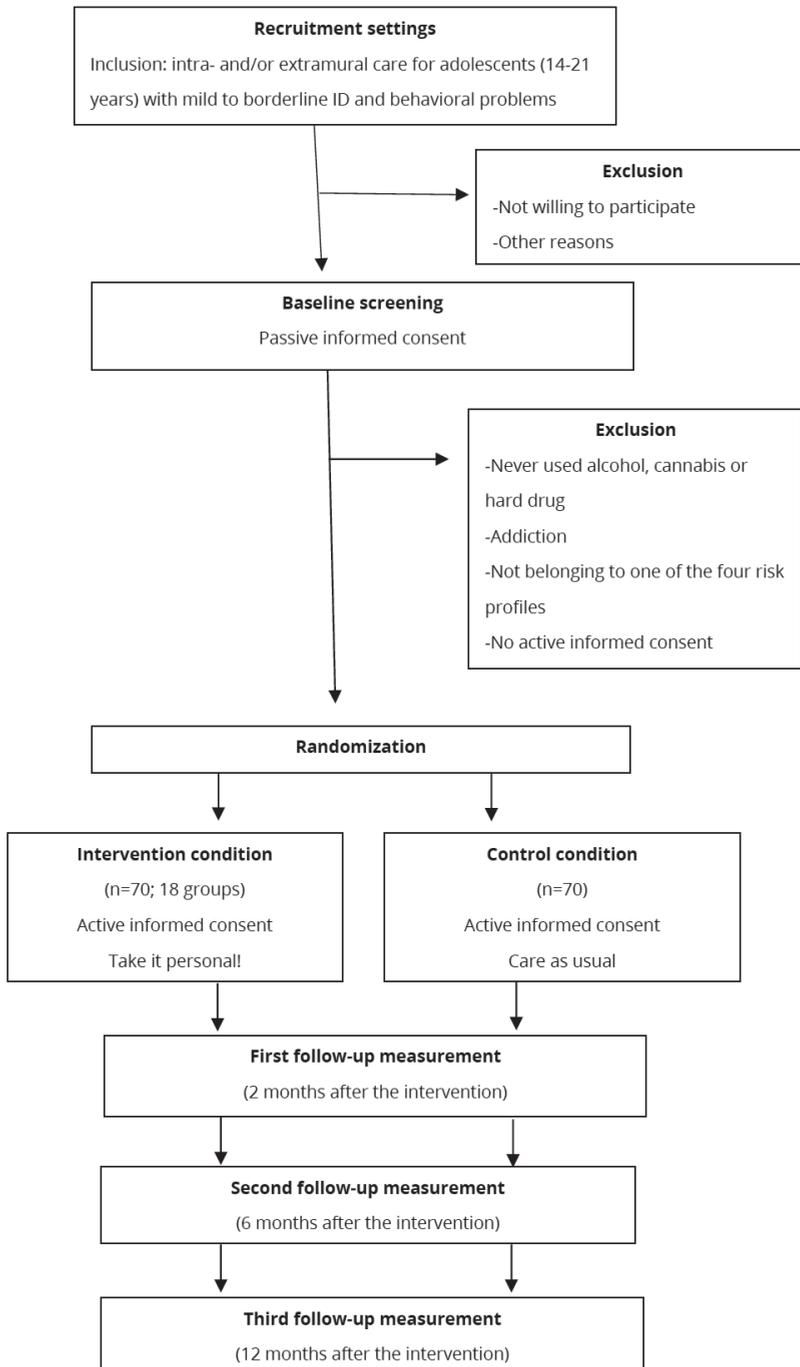
The main hypothesis is that the intervention will reduce alcohol, cannabis, and hard drug use among individuals in the intervention group compared to those in the no intervention control group. We also expect a decrease in the intention to use alcohol, cannabis and/or hard drugs in the future, a change in motives for alcohol and/or drug use after two, six, and twelfth months in the intervention group compared with the control group. In addition, the effect of the program on internalizing and externalizing behavioral problems will be tested after two, six and twelve months after start of the intervention. We hypothesized that the intervention would decrease internalizing and externalizing behavioral problems in the intervention group compared with the control group.

Methods/Design

Study design

The effectiveness of the intervention will be tested in an RCT with two arms, an intervention group and a control group (see Fig. 1). The intervention effects will be tested at two, six, and twelfth months after the start of the intervention. Participants will be 140 adolescents with mild to borderline ID and behavioral problems receiving treatment in treatment facilities. The adolescents will be randomly assigned to the intervention condition (Take it personal!; n = 70) or the control condition (care as usual; n = 70). Recruitment, inclusion, and randomization of the participants will start in the beginning of 2015. The program will start in the spring of 2015 and will continue until the end of 2015. This trial is registered at the Dutch trial register (trial registration: Dutch Trial Register NTR5037. Registered 15 April 2015). The trial has approval of the faculty Ethics Committee of the Radboud University (number: ECSW2015-0903-303).

Figure 1. Study design



Participants

Recruitment

'Take it personal!' was developed for adolescents (14–21 years) with mild to borderline ID who are admitted to treatment centers in the Netherlands. These adolescents often have severe internalizing (anxiety, depression) and externalizing (aggression, antisocial behavior) behavioral problems or psychiatric diagnoses. Participants will be recruited through treatment centers. About ten treatment centers in the Netherlands will be invited to participate in this RCT. These treatment centers offer specialized residential and extramural care for adolescents with mild to borderline ID and severe behavioral problems. A team of therapists will implement the intervention and behavioral scientists and participating institutions will receive the materials for 'Take it personal!' free of charge.

After selecting the treatment centers, adolescents will complete a screening questionnaire to identify adolescents who meet the inclusionary criteria. Adolescents will be eligible to enter the trial if they meet the following inclusion criteria: (1) life time prevalence of alcohol, cannabis, or hard drug use, (2) belonging to one of the four personality high-risk groups (SS, IMP, AS or NT), and (3) providing signed informed consent along with the signed informed consent from parents or legal representative. Adolescents scoring more than one standard deviation above the sample mean on one of the four high-risk personality scales of the Substance Use Risk Profile Scale (SURPS) (Woicik, Stewart, Phil & Conrod, 2009) will be classified as belonging to that risk profile. Adolescents who will score above the average on more than one personality profile will be assigned to the profile for which they showed the largest statistical deviation with respect to the z-score (cf. Lammers et al., 2011). Adolescents with addiction problems will be excluded from participation in the intervention and the trial because this intervention is not considered sufficient for them. For these adolescents, treatment will be organized in collaboration with a regional institute for addiction care. Parents or legal representatives will be informed about the study through a letter sent home, asking them to contact the researchers by phone or email if they do not wish their child to participate in the screening (passive informed consent). Adolescents will be informed on the day of the screening, at which time they have the option not to participate in the trial. Parents (when participants are under the age of 18 years) and adolescents will need to provide active informed consent to participate in the RCT. After the screening questionnaire and informed consent, the adolescents will be individually randomized to either control condition or experimental condition. Power analyses In the present study, we aimed to show a medium effect size (cf. Conrod et al., 2006). Power-analysis was conducted based on an average effect size

of $f = 0.25$ (Cohen, 1960), a 2-sided test at $\alpha = .05$, a statistical power (1-beta) of 0.80, and 10 % loss-to-follow-up after randomization. Based on these assumptions a sample size of 140 adolescents (70 in each condition; G-power) is required. Eighteen intervention groups are required, assuming that up to a maximum of four participants will be included in intervention group.

Intervention

Adolescents in the intervention group will receive the intervention 'Take it personal!' and care as usual. Adolescents will participate in one of the four versions of the intervention that address each high-risk personality trait. 'Take it personal!' comprises three main components: (1) psycho-education, (2) behavioral coping skills, and (3) cognitive coping skills. The first phase the intervention focuses on psycho-education regarding the participants' personality profile and coherent problematic coping behavior, like substance abuse or aggression. In this phase, participants are motivated to become familiar with their personality profile and learn to deal with their personality through exercises. Daily life experiences and coherent physical, cognitive, and behavioral reactions will be analyzed. Participants will set individual goals, which they will try to achieve during the training. The coping skills training will engage adolescents in activities aimed at recognizing automatic thoughts. Participants will identify personality-specific thoughts that lead to problematic behavior. For example, the intervention aimed at adolescents with the personality profile 'Impulsive' will focus on thinking before taking action. Simultaneously, the participants will be trained to use cognitive restructuring techniques to counter such thoughts. Participants will edit a personalized 'changing plan' to deal differently with their problematic and risky behavior.

The intervention will involve five group sessions and six individual sessions spread across six weeks. One individual and one group session will be conducted every week, except for week 5 during which only one individual session will be offered. This week will be used to give participants extra time to practice the assigned tasks in their daily lives. Individual sessions will last 30 minutes and group sessions will last 45 minutes. During individual sessions, the trainer and participant will prepare that week's group session. During the individual sessions, the participants will be able to pick and bring a confidant from their team of supervisors. This will increase the generalization to everyday life and ensures that participants feel prepared and secure during the group sessions. Two qualified trainers, one psychomotor therapist and a behavioral scientist, will carry out the intervention. A psychomotor therapist will have to be present because of the exercises based on

psychomotor principles while a behavioral scientist needs to be involved because of the principles of CBT and MI. Training should be provided by a behavioral scientist who is experienced with these techniques. All trainers will participate in a two-day training on the principles of CBT and MI and all sessions will be practiced. All group sessions will be carried out in the psychomotor department of the home institution. Individual sessions will be held in flexible rooms. Each individual and group session will have the same structure. Each individual session will start by asking the participant's confidant what he or she has learned in the last group session and what exercises they have done. Subsequently, the trainer and participant will do some exercises and assignments. In the individual session, participants will be asked to give examples from their daily lives. These examples will be used to complete exercises within the group sessions. Participants' confidants will play a supporting role in the individual session. Afterward, the participant and trainer will prepare the next group session. All group sessions will start by offering participants some refreshments to make them feel at ease and secure. These sessions will comprise exercises, games, and psychomotor practices prepared during the individual sessions. Every group session will comprise at least one exercise from psychomotor therapy. To close the group sessions, the trainers and participants will summarize that group session together. The training will be developed according to the principles of CBT, and it will be adjusted to the cognitive capacities of adolescents with mild to borderline ID.

Adolescents assigned to the control group will receive no further intervention, but they will receive 'care as usual'. 'Care as usual' will not be standardized or protocolled, but we will make an inventory of other prevention and intervention programs aimed at substance use. Most adolescents receive treatment for their own specific problems; some of them receive residential care while others receive extramural treatment. In both cases, treatment is formulated through personal goals in a so called 'individual treatment plan'. A multidisciplinary team is involved in the treatment of each adolescent. All participating adolescents will be rewarded with a small gift.

Data collection

During the pre-test, the participants will complete the SURPS-NL-LVG questionnaire (SURPS-NL-LVG; (Woicik et al., 2009); custom version SURPS; (Bergsma, 2010). Based on their scores on this questionnaire, participants will be classified into one out of the four personality profiles (SS, IMP, AS, and NT).

Outcomes

'Take it personal!' aims to decrease substance use among adolescents with mild and borderline ID. We operationalized goals for limiting alcohol, cannabis, and hard drug use. The primary outcome of alcohol use will be the percentage of decrease in binge drinking, weekly use, and problematic use. The primary outcomes of cannabis use will be the percentage of decrease in lifetime cannabis use and weekly use. The primary outcome of hard drug use will be the percentage of decrease in lifetime use. These outcome measures will be assessed at baseline and two, six, and twelfth months after the intervention using the Substance Use and Misuse among Intellectually Disabled Persons Questionnaire (SumID-Q; VanderNagel, Kiewik, van Dijk, de Jong & Didden, 2011)). This questionnaire is specifically developed to measure substance use among people with intellectual disabilities. Secondary outcomes are the intention to use less alcohol and/or drugs in the future (de Vries, Dijkstra & Kuhlman, 1988; Malmberg et al., 2010), motives for alcohol and/or drug use (Drinking Motives Questionnaire-Revised-Short Form (DMQ-R-SF) (Kuntsche & Kuntsche, 2009), and internalizing and externalizing behavioral problems measured by YSR (Verhulst, Van der Ende & Koot, 1997). Adolescents with mild to borderline ID are able to complete self-report instruments with some support (Douma, Dekker, Verhulst & Koot, 2006). Therefore, all measures will be supported using structured interviews.

This study examined the effectiveness of 'Take it personal!' in daily practice (effectiveness trial). In this case, it is important to monitor the program fidelity (Dusenbury, Brannigan, Falco & Hansen, 2003; Ennett et al., 2011). For this reason, we will monitor five domains: 1) adherence, 2) exposure (dosage), 3) quality of the delivery, 4) responsiveness of the participant, and 5) program differentiation (cf. Ennett et al., 2011).

Statistical analysis

Descriptive analyses will be conducted to examine whether the randomization results in a similar distribution of demographic factors and outcome measures in both conditions. Variables that show different distributions between the two groups will be entered as confounders in all models testing the effectiveness of the intervention. The effect of the intervention program on the primary and secondary outcome variables will be tested in accordance with the intention-to-treat principle and in a completers-only framework by using Mplus (Muthén & Muthén, 2007). Intention-to-treat means that all participants will be analyzed in the condition to which they will be assigned by randomization. Missing data will be handled by multiple imputation (MI). A total of 20 datasets will

be completed by multiple imputation. Mplus will read the 20 datasets via the TYPE = IMPUTATION option and will carry out the desired analyses for each dataset. Mediating the parameter estimates will then aggregate the results for the 20 analyses. With respect to the completers-only analyses, only the participants with scores for all time points will be included. In both the intention-to-treat and the completers-only analyses, the effect of the intervention condition will be compared to the control condition. Because the data have a multilevel structure (i.e., individuals are 'clustered' within treatment centers), the individual respondents within treatment centers may be interdependent. To correct for the potential non-independence (complexity) of the data, the TYPE = COMPLEX procedure in Mplus will be used. This procedure corrects the standard errors of the parameter estimates for dependency, leading to unbiased estimates. The results of the study will be reported in accordance with the CONSORT statement (Begg et al., 1996; Moher, Schulz & Altman, 2003).

Discussion

The present paper described the study protocol to test the effectiveness of the secondary preventive program called 'Take it personal!' by means of a Randomized Controlled Trial. The intervention aims to prevent adolescents with mild to borderline ID from problematic substance use by helping them develop competences to deal with their personality traits. It is hypothesized that adolescents in the intervention group will show a higher reduction in substance use compared to adolescents in the control group at follow-up.

Strengths and limitations

The intervention has several strengths. First, this intervention is the first secondary prevention program in the Netherlands for adolescents with mild to borderline ID that focuses on helping adolescents acquire skills to deal with high-risk personality profile. Second, the program is based on a proven effective intervention (Conrod et al., 2006; Conrod et al., 2010; Conrod et al., 2011; Lammers et al., 2011). Third, the program incorporates elements of CBT and MI techniques, which have been proven effective for adolescents with mild to borderline ID (Webb et al., 2012; Didden et al., 2006; Riper et al., 2014). Fourth, 'Take it personal!' will fill an important gap with regard to prevention programs for adolescents with mild to borderline ID. Fifth, the intervention has been developed especially for the target group according to proven effective techniques, like psychomotor therapy and the guidelines for effective interventions for people with mild ID (De Wit et al., 2011). This is an important strength, as research has shown that interventions for non-disabled peers

are insufficient for people with mild to borderline ID (De Wit et al., 2011). Six, during the individual sessions, the participants will be able to bring their own confidants from their supervising team, which will increase the generalization to everyday life and ensure that participants will feel prepared and secure during the group sessions. The importance of a RCT is underlined by the fact that nationally and internationally, no scientific evidence supports the effectiveness of current prevention programs on adolescents with mild to borderline ID (Lokman et al., 2012; Kerr et al., 2013).

A limitation of this study is that the behavior data as well as placement in intervention groups (SS, IMP, AS, NT) will be based on self-reports, which might lead to measurement errors. However, research has shown that adolescents with mild and borderline ID are able to complete self-report instruments, although with some support (Douma et al., 2006). Accordingly, all measurements will be done under the supervision by means of structured interviews.

Implications for practice

If the intervention proves to be effective in preventing substance use by adolescents with mild to borderline ID, the study will have strong practical relevance for secondary prevention and intervention programs. It could reduce healthcare costs to society, as adolescents with addiction disorder provide major social risks and costs (for example, costs associated with addiction care as well as social problems like theft, vandalism, aggression etc.).

Conclusion

This paper describes an effectiveness study design of a secondary preventive program developed for substance using adolescents with mild to borderline ID. Evaluation of the intervention will provide insights into the effectiveness of 'Take it personal!' prevention program.

CHAPTER

5

Take it personal! Development and modelling study of an indicated prevention program for substance use in adolescents and young adults with mild intellectual disabilities and borderline intellectual functioning

This chapter is published as:

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Abstract

Background: This paper describes the theory and development of Take it personal! an indicated prevention program aimed at reducing substance use in individuals with mild intellectual disabilities and borderline intellectual functioning.

Method: The process of the development of Take it personal! followed the steps of the Intervention Mapping protocol. Take it personal! is based on the theory that personality traits are an important construct to understand substance use (14–30 years old). A small modelling study was conducted with six adolescents to examine the feasibility, user-friendliness and potential effectiveness of the intervention.

Results: The results showed that the intervention has good feasibility and user friendliness. Post-intervention evaluation of frequency, binge drinking and problematic use indicated that use was lower than at pre-intervention.

Conclusions: Take it personal! can be a promising preventive intervention designed to reduce substance use in individuals in this target group. A larger scale study is needed to draw further conclusions.

Introduction

Substance use among individuals with a mild intellectual disability or borderline intellectual functioning (MID-BIF; IQ between 50 and 85 and limitations in social adaptive skills; American Psychiatric Association, 2013) is a pressing problem. In treatment facilities in the Netherlands, individuals with mild intellectual disabilities and individuals with borderline intellectual functioning are commonly considered to belong to the same target group (de Wit, Moonen, & Douma, 2011) as both groups suffer from the same problems as a consequence of impaired intellectual and adaptive functioning (Baglio et al., 2014; Hassiotis et al., 2008; Peltopuro, Ahonen, Kaartinen, Seppälä, & Närhi, 2014). Since people with MID-BIF lead more ordinary and less restricted lives now than they did a decade ago, they became more at risk to be exposed to social and environmental pressures encouraging them to adopt behaviors that negatively affect their health, such as exposure to stressful events and alcohol and drugs (Kepper, VanDenEijnden, Monshouwer, & Vollebergh, 2014; Taggart, McLaughlin, Quinn, & Milligan, 2006). Eventually, this level of exposure may lead to substance use disorders and related problems (Burgard, Donohue, Azrin, & Teichner, 2000; Kepper et al., 2014; Taggart et al., 2006).

Studies have shown that substance use is common in adolescents and young adults with MID-BIF, especially among those with behavioral problems and co-morbid psychopathology who are admitted to treatment facilities (VanDerNagel et al., 2017; Van Duijvenbode et al., 2015). Prevalence rates show that 75%–85% of adolescents with MID-BIF and severe behavioral problems who are admitted to treatment facilities show lifetime alcohol use or use alcohol on a regular basis, and 25%–50% of these adolescents use drugs (in particular, cannabis) on an occasional or regular basis (daily or weekly use). For most cannabis users, cannabis is a part of their daily routine (Bransen, Schipper, & Blekman, 2009). Adolescents with a MID-BIF are at a higher risk for substance use disorders compared to their non-disabled peers (Burgard et al., 2000; McGillicuddy, 2006; Van Duijvenbode et al., 2015).

The consequences of substance use are more negative for adolescents with MID-BIF than for their non-disabled peers, as alcohol and drugs disproportionately affect the physical and mental health of people with MID-BIF, leading to more severe behavioral and social difficulties (Barrot & Paschos, 2006; Didden, 2017; To, Neirwynck, Vanderplasschen, VanHeule, & VanDerVelde, 2014). Substance use by adolescents with MID-BIF causes various problems, including social, mental, behavioral, criminal and financial (Taggart et al., 2006). Moreover, adolescents with MID-BIF are at an increased risk for substance use disorders (Burgard et al., 2000; Taggart et al., 2006).

Because of these issues, early intervention before the onset of substance use disorders is of vital importance. Therefore, it is necessary to develop preventive interventions and adapt the existing ones specifically to the needs and capabilities of adolescents with MID-BIF (Kiewik, VanDerNagel, Engels, & de Jong, 2017). Practitioners from treatment facilities for people with MID-BIF are often inexperienced with the treatment of substance use. In the past decade, attention to substance use in intellectual disability care has increased, leading to the development of several interventions (Kiewik et al., 2017). However, the need for interventions tailored specifically to this group is still high, as effective prevention programs for adolescents with MID-BIF are rare (Lawrence, Kerr, Darbyshire, Middleton, & Fitzsimmons, 2009).

Current prevention programs for adolescents with MID-BIF focus mainly on increasing knowledge of alcohol and drugs and the negative consequences of substance use (Kerr, Lawrence, Darbyshire, Middleton, & Fitzsimmons, 2013; Kiewik, VanDerNagel, Kemna, Engels, & de Jong, 2015). Increasing knowledge of substance use prevention may be ineffective for adolescents with MID-BIF, because that the concept of behavioral change in people with MID-BIF is not likely to be a well-considered and rational process.

Studies have shown that adolescents with MID-BIF already have enough knowledge of substances and their negative consequences (Kiewik et al., 2015; VanDuijvenbode et al., 2015). An intervention should, therefore, focus on adolescents and young adults who already use alcohol and other substances and teach them useful competences to prevent further development of a substance use disorder (i.e. indicated prevention).

The present paper describes the theory and development of Take it personal! an indicated prevention program for reducing substance use in adolescents with MID-BIF and severe behavioral problems. Take it personal! is based on the theory that personality traits are important in understanding substance use. Studies have distinguished four personality profiles based on impulsivity, sensation seeking, anxiety sensitivity and negative thinking (assessed with the Substance Use Risk Profile Scale, SURPS; Poelen, Schijven, Otten, & Didden, 2017; Woicik, Stewart, Phil, & Conrod, 2009), all of which are known to be associated with substance use (disorders) in the general population (Conrod, Comea, & Maclean, 2006; Woicik et al., 2009) and among individuals with MID-BIF (Poelen et al., 2017). In addition, this paper contains an assessment of its feasibility, user-friendliness and potential effectiveness based on the results of a small modelling study.

Methods

Intervention mapping

Take it personal! is an indicated prevention program aimed primarily at reducing substance use (alcohol, cannabis and illicit drug (other drugs that are more addictive, more potent and more toxic, such as cocaine in any form, e.g. crack; club drugs, e.g. ecstasy; hallucinogens, e.g. LSD or opioids, e.g. heroin) and preventing the onset of substance use disorder. The secondary aims of Take it personal! were to decrease the intention to use alcohol, cannabis and/or illicit drugs in the future and to decrease internalizing and externalizing behavioral problems. Intervention Mapping (IM) was used to guide the development of this intervention.

IM is a useful tool for theory and evidence-based development of health promotion interventions (Bartholomew, Parcel, Kok, & Gottlieb, 2001), and it has been shown to be useful in developing substance use interventions (e.g. Dupont, Lemmens, Adriana, VanDeMheen, & DeVries, 2015) and interventions for people with MID-BIF (Schaafsma, Stoffelen, Kok, & Curfs, 2013). The IM process starts with a needs assessment followed by 5 steps: (i) definition of program objectives, (ii) selection of intervention methods and strategies, (iii) development of program plan and pilot study of the intervention, (iv) adaptation and implementation plan and (v) evaluation plan. The intervention aims to trigger a behavioral change in adolescents and young adults (age 14–30 years) with MID-BIF and severe behavioral problems (Schijven, VanDerNagel, Lammers, & Poelen, 2014). Take it personal! targets adolescents and young adults who (i) use alcohol, cannabis or illicit drug use at the stage of experimental use to a mild substance use disorder according to the DSM-5 (American Psychiatric Association, 2013), and (ii) who can be placed in one of the four personality high-risk groups (SS, IMP, AS or NT). A moderate to severe substance use disorder according to the DSM-5 was a contraindication. Co-morbid behavioral problems were no contraindication but for individuals experiencing extreme aggression problems or suffering from psychotic symptoms, the intervention is not appropriate. Take it personal! is based on the theory that personality traits are important in understanding substance use. Studies have distinguished four personality profiles based on impulsivity, sensation seeking, anxiety sensitivity and negative thinking, all of which are known to be associated with substance use (disorders) in the general population (Conrod et al., 2006; Woicik et al., 2009) and among individuals with MID-BIF (Poelen et al., 2017). Each personality profile is also associated with specific substance misuse patterns and vulnerability to specific forms of co-morbid psychopathology in adolescents (Conrod & Woicik, 2002). In individuals with MID-BIF, substance use is often related to these forms of co-morbid psychopathology and

these associated profiles (Poelen et al., 2017; VanDuijvenbode et al., 2015) and therefore interventions targeting these four personality profiles are highly relevant. Impulsive adolescents lack the ability to delay a behavioral response when faced with immediate reinforcement (Conrod & Woicik, 2002). Sensation seeking is associated with increased risk-taking or reckless behaviors among teens, such as shoplifting, unprotected sex, dangerous driving, and alcohol and other drug use (Arnett, 1994). Sensation seekers tend to be heavy drinkers at an increased risk for adverse drinking consequences (Conrod et al., 2006). Highly anxious sensitive persons show increased levels of drinking (Stewart, Loughlin, & Rhyno, 2001), are more responsive to the anxiety-reducing effect of alcohol, are more likely to use alcohol to cope with negative feelings (Comeau, Stewart, & Loba, 2001) and are at risk for problem drinking (Conrod, Pihl, & Vassileva, 1998). They often cope with their negative feelings by using a combination of withdrawal (from social situations), dependence (on others to make them feel better), or alcohol and/or drug use. People with high levels of negative thinking or depression often have specific motives for substance use (Blackwell, Conrod, & Hansen, 2002) that help them cope with negative feelings (Malmberg et al., 2010). The intervention *Take it personal!* aims at giving adolescents and young adults with MID-BIF confidence to deal with their personality traits and associated motives for excessive substance use. For each personality profile, a different intervention was developed and participants join the intervention with participants with a similar personality profile. The design and construction process of the intervention is identical for each profile, but accents are different and focus on the particular personality profiles. For instance, participants with the personality profile impulsive behavior learn to think before they act, and practices for participants with an anxiety sensitivity profile focus on relaxation exercises and overcoming fears. The intervention is based on methods and practical strategies of motivational interviewing (MI) and cognitive behavioral therapy (CBT), which have been proven to be effective in decreasing alcohol and drug use among non-disabled adolescents (Conrod, Castellanos- Ryan, & Mackie, 2011; Lammers et al., 2015; Riper et al., 2014). MI is a collaborative person-centered technique to elicit and strengthen motivation for change (Miller, 1983). It focuses on exploring and resolving ambivalence through motivational processes within the individual that facilitate change. MI is considered an evidence-based practice in the treatment of individuals with substance use disorders (Riper et al., 2014), and it has been adapted for persons with MID-BIF (Frielink & Embregts, 2013). CBT is an action-oriented form of psychosocial therapy, which assumes that maladaptive or ineffective thinking patterns cause maladaptive behavior and negative emotions (maladaptive behavior is behavior that is counter-productive or interferes with everyday living). CBT has become increasingly available to people with intellectual disabilities, and studies have

shown positive effects of CBT on the reduction of mental health problems, anger and aggression in people with MID-BIF (Didden, Korzilius, Oorsouw, & Sturmey, 2006; Vereenoghe & Langdon, 2013). Take it personal! is based on simplified CBT methods and practical strategies and does not comprise a complete CBT protocol. Using CBT with individuals with MID-BIF requires adaptations such as using simplified language, working in small steps and carefully applying the methods to home and school/work situations, shorter sessions and additional explanation. In addition, CBT in Take it personal! is simplified and does not teach participants to distinguish feelings and thoughts that precede SU (Didden et al., 2006). Another technique especially added for the target group in this intervention is psychomotor therapy. Psychomotor therapy is a commonly used method for adolescents with MID-BIF, and practitioners have good experiences with daily body movement exercises conducted through sports and physical education. The psychomotor therapist focuses on problems that emerge in movement behavior, body language, physical tension, posture, body sensations and body experience. First, results of effectiveness of psychomotor therapy among adolescents with MID-BIF show positive findings (Bellemans, 2019). The proposed intervention will incorporate psychomotor therapy exercises into each group session to complement the CBT. Take it personal! comprises three main components: (i) psycho-education, (ii) behavioral coping skills and (iii) cognitive coping skills. At the start, the intervention focuses on psycho-education addressing the participants' personality profile and related problematic coping behavior, like substance use or aggression. Psycho-education was adapted to the level of intellectual functioning by using games, visual support and the use of daily life experiences. The confident (the role of the confident is explained in the following paragraph) has a supporting role by bringing up these daily life experiences. In this phase, the participants will become familiar with their personality profile and learn to deal with their personality through exercises. Daily life experiences and subsequent physical, cognitive and behavioral reactions will be analyzed. Moreover, they will set individual goals, which they will encounter during the training. The participants will identify personality-specific thoughts that lead to problematic behavior. For example, the intervention aimed at adolescents with the personality profile "Impulsive" will focus on thinking before taking action. Simultaneously, the participants will be trained to use cognitive restructuring techniques to counter such thoughts. They will be asked to edit a personalized "changing plan" to deal differently with their problematic and risky behavior. Table 1 shows a schematic overview of the themes and objectives per week. The intervention will involve five group sessions and six individual sessions spread across 6 weeks. Individual sessions will last 30 min, and group sessions will last 45 min (depending on intellectual functioning, there was the possibility to spend more or less time per group or individual

session). During the individual sessions, participants may invite a confidant for support. The confidant is someone from the professional network of the participant (e.g. a caregiver), who has an explicit role in establishing the transfer of training to everyday life situations. The design of the intervention with individual sessions and group sessions was specifically modified for this target group. Personality-targeted interventions for adolescents without MID-BIF only comprise group sessions (i.e. Conrod et al., 2011; Lammers et al., 2015). In each session, trainer, participant and confidant will go through the group sessions of that week. With this approach, the participants are better prepared for the group session. Besides, it provides repetition, which is necessary for effective interventions for individuals with MID-BIF (de Wit et al., 2011). Participants use a workbook during the sessions for different exercises, such as the “changing plan.” The workbook contains minimal text and is especially designed with individuals from the target group together with graphic designers.

Table 1 *Schematic overview of the themes and objectives of Take it personal! per week*

Theme's	Objectives
Week 1 About you	Meeting each other, establishing security and trust. Room and time to make participants feel at ease. Explaining the personality profile and recognition of participants own situation in a positive way. A small step to the consequences for behavior.
Week 2 Effects	Setting individual long term goals for the intervention and show the participants that small steps are needed to achieve these goals. Understanding that risky behavior can stand in the way of achieving these long term goals.
Week 3 What precedes?	Identification of thoughts and feelings that precede behavior and learning to recognize these signals. Learning participants to realize that there is a moment to make a different choice.
Week 4 The challenge	Participants make a personalized change plan that helps them to cope differently with their behavior. This includes specific actions for the participant and people in his/her environment to support him/her.
Week 5 Evaluating the change plan	Evaluating the change plan and if necessary adapt it. Specific focus on success and positive reinforcement.

Modelling study

Design

Based on the SURPS (Poelen et al., 2017; Woicik et al., 2009), participants were enrolled in two intervention groups (n = 4 impulsive behavior and n = 2 sensation seeking). Participants received either the impulsive behavior intervention or the sensation seeking intervention, and all participants were associated with a treatment center for their

behavioral problems in the Netherlands. A pre-test (2 weeks before the intervention) and a post-test were conducted (2 weeks after the last session) to measure potential intervention effects. To measure feasibility and user-friendliness, participants and trainers were asked to fill in questionnaires 2 weeks after the last session.

Participants and procedure

Seven adolescents with MID-BIF with severe behavioral problems placed in residential care were invited to participate. Based on the SURPS (Poelen et al., 2017; Woicik et al., 2009), four adolescents were enrolled in the impulsivity intervention and three adolescents in sensation seeking. One of the participants ran away from the treatment center and dropped out, leading to an ultimate sample size for the pilot study of six participants. Other than this participant, there was no further dropout of any sessions. The participants were three boys and three girls between 15 and 19 years of age ($M = 16.7$; $SD = 1.5$). The average level of intelligence (according to the personal files) of the participants was 70.2 ($SD = 6.4$) with an IQ ranging from 58 to 77. Three participants were diagnosed with ADHD, with one having a comorbid conduct disorder. Two participants were diagnosed with attachment disorder and one with symptoms of depression. Therapists were a psychologist and psychomotor therapist who had received specific training on Take it personal! prior to the start of the study, including training in CBT, MI and the theoretical background of the intervention. A pre-test was conducted 2 weeks before the start of the intervention and a post-test 2 weeks after the last session.

Measurements

Feasibility

Feasibility in this study was investigated as it is pivotal to know how trainers experienced providing the intervention. This is helpful for implementation and adherence of trainers and participants to the protocol (Carney, Johnson, Carrico, & Myers, 2020). To assess feasibility, trainers were asked to complete an open-ended questionnaire after the intervention. The first section of the questionnaire consisted of general questions, for example, "Do you think the training connects with the target group? Why do you think so?" or "Is there sufficient variation between talking and doing things during the sessions?" In the second part, the trainers were asked to answer the following questions for each assignment in the training, "Did you achieve the purpose of the assignment during the sessions?" "Were the assignments matching with the target group?" and "Why do you think so?"

User-friendliness

User-friendliness was assessed to obtain feedback about the intervention in this study, because it is important as user-friendliness prevents high numbers of dropout (a lack of user-friendliness evokes higher levels of stress; Pauly et al., 2018). Questions were about how much they liked the intervention, whether they thought they had learned anything from the intervention, whether they thought the counsellor had added value, how they liked the design of the intervention, and whether they thought there was a good balance in talking and doing things during the intervention. To measure user-friendliness, the participants were asked to fill in an evaluation questionnaire after the intervention. The first part of the questionnaire consisted of general questions about the intervention; examples are, "I liked the intervention" or "I liked the design of the workbook." Participants could answer these questions on a 4-point scale illustrated with figures of thumbs up or down. Answer categories ranged from (1) "not right at all" (two thumbs down) to (4) "totally right" (two thumbs up). In the second part, the participants were asked about their opinion regarding specific assignments, for example, "I liked the Bingo game." They could answer those questions using the same 4-point scale.

Potential effectiveness

To assess alcohol and drug use, we administered the Substance Use and Misuse in Intellectual Disability Questionnaire (SumID-Q; VanderNagel, Kiewik, Van Dijk, De Jong, & Didden, 2011; VanDuijvenbode, Didden, Korzilius, & Engels, 2016) at the pre-test and at the post-test 2 weeks after the last session. The SumID-Q was especially developed to determine the substance use among individuals with MID-BIF. Similar items were included to measure alcohol, cannabis and illicit drug use. Primary outcomes for substance use were frequency of use, binge drinking and severity of substance use. The frequency of use was assessed with the item, "How often do you use alcohol?" Response options ranged from (1) "less than once a month" to (4) "almost every day" (VanDerNagel et al., 2011; VanDuijvenbode et al., 2016). Binge drinking was assessed with the question, "How often do you drink more than 6 glasses?" The answer categories ranged from (1) "never" to (5) "almost every day" (VanDerNagel et al., 2011; VanDuijvenbode et al., 2016). The severity of alcohol use was assessed using the Alcohol Use Disorders Identification Test (AUDIT; Babor, Higgins- Biddle, Saunders, & Monteiro, 2001), which was incorporated in the SumID-Q. The severity of drug use was assessed using the Drugs Use Disorders Identification Test (DUDIT; Berman, Bergman, Palmstierna, & Schlyter, 2003). The items measured the frequency and quantity of use, dependency and problems related to

use. An example of an item is, "How often did you regret drinking/ drug use?" Response options ranged from (1) "never" to (5) "almost every day." Each scale consisted of 10 items (VanDerNagel et al., 2011). Total scale scores were calculated by summing the items. These outcomes measures have shown psychometric qualities with respect to validity and reliability (Poelen et al., 2017; VanDuijvenbode et al., 2016).

Analysis

To provide information on the feasibility and user-friendliness of Take it personal! descriptive analyses were conducted based on data derived from a combination of Likert-scale questions and open-ended questions. To test the potential effectiveness, we operationalized goals for alcohol, cannabis and illicit drug use (Schijven, Engels, Kleinjan, & Poelen, 2015). We examined whether there was a decrease in use of alcohol, cannabis and illicit drug use in absolute numbers in the last month use, weekly use and the AUDIT (Babor et al., 2001) and DUDIT (Berman et al., 2003).

Results

Feasibility

All four trainers reported that the intervention connected well with the target group, and the variation between talking and practice in the sessions was appropriate. According to the trainers, the participants handled the theory (CBT) parts well. The trainers reported that involvement of a confidant (a person who joins the participant in the individual sessions for support) during the individual sessions was of great value for the transfer to the daily life of the participants, as the trainers indicated. The adjustments that were suggested after a careful evaluation of the intervention with the trainers lead to changes that were in line with the underlying theory of the intervention. The main adjustment included increasing the trainer's and counsellor's awareness of the importance of discussing substance use in both the individual sessions and group sessions, and skipping an individual session during week five to avoid repetition. In week five participants, there is now an optional individual session or contact by phone to repeat this week with their personal changing plan.

User-friendliness

Table 2 shows the results of the evaluation of the questionnaires filled out by the participants of Take it personal!. The participants indicated they liked the intervention, they

were satisfied with the design of the workbook, they were satisfied with their confidant, and they were content with the variation between talking and doing assignments in the intervention. They also indicated that they have learned something from the intervention.

Table 2 *User-friendliness (N=6)*

	M	SD	Minimum	Maximum
Liking the intervention	3.2	0.4	3	4
Learned something from the intervention	3.2	0.8	2	4
Satisfied about the counselor	3.2	0.8	2	4
Sufficient variation in the intervention	3.3	0.5	3	4
Satisfied about the design	2.9	0.4	2	4

Note. Answer categories ranged from (1) 'not right at all' to (4) 'totally right'.

Potential effectiveness

Post-intervention evaluation of frequency of alcohol and drug use, binge drinking and problematic alcohol and drug use indicated that level of use was lower than at pre-intervention (see Table 3).

Table 3 *Difference between pre-test and post-test in absolute numbers for alcohol, cannabis and other illicit drug use (N=6)*

	Pre-test (N=6)	Post-test (N=6)
Alcohol		
Last month use	6	1
Weekly use	4	1
Binge drinking	3	1
AUDIT	6	4
Cannabis		
Last month use	5	2
Weekly use	3	1
Other illicit drug		
Last month use	4	2
Weekly use	4	1
DUDIT	5	4

Note. Abbreviations: AUDIT, Alcohol Use Disorders Identification Test; DUDIT, Drugs Use Disorders Identification Test.

Discussion

The IM protocol was utilized to develop Take it personal! intervention based on theory and the results from other research that were expected to improve the likelihood of effectiveness of the intervention. The use of the IM protocol increased our understanding of the mechanisms underlying the effectiveness of Take it personal. Evaluating the

program with a small modelling study was part of the process of the IM protocol (Bartholomew et al., 2001). This helps to investigate whether these theoretical principles have the same effect within the MID-BIF target group as in adolescents without MID-BIF, where effectiveness has been demonstrated in several studies (Conrod et al., 2013; Lammers et al., 2017; Mahu, Doucet, O'Leary-Barrett, & Conrod, 2015). In addition, the modelling study supported the feasibility and user-friendliness of Take it personal!. The trainers in this study concluded that the intervention can be conducted without difficulties. The participants felt positive about the intervention and had the feeling they have learned something from the intervention. They enjoyed the intervention, and they were motivated to complete it. This finding is promising because motivation is an important predictor of intervention completion and effectiveness (Deci & Ryan, 2000). Dropout from interventions, particularly those targeting adolescents, is a common problem, with dropout rates being as high as 50% (Connor et al., 2006). High dropout is often attributed to the adolescents disliking the intervention (Kahn, Ducharme, Travers, & Gonzalez-Heydrich, 2009).

With regard to potential effectiveness, this modelling study revealed that a number of participants were able to reduce their use of alcohol, cannabis and illicit drugs after the intervention. Given methodological constraints, we were not able to establish whether this change was associated with the intervention; therefore, a larger scale study is needed to draw conclusions about the effectiveness of Take it personal!.

Several limitations need to be acknowledged regarding the use of IM and this study. First, IM provides a rather static picture, while developing an intervention is a dynamic and constantly changing process. Nevertheless, the intervention was developed based on sound systematic theory and evidence. Second, only a small number of participants were included in this study, making it difficult to draw conclusions. Besides, because of this small group of participants it is only generalizable to a limited extent. Third, questionnaires to assess the feasibility and user-friendliness of the program were bespoke questionnaires developed for this study, and therefore, there is no information about the reliability, validity and other psychometric aspects of these questionnaires. Last, information about substance use as well as the user-friendliness of Take it personal! was obtained by self-report questionnaires. Future research could include additional parent- or staff-reported assessments in order to avoid potential self-report bias. Concluding, Take it personal! can be a promising indicated preventive intervention designed to reduce substance use in individuals with MID-BIF. Although, a larger scale study is needed, to draw firm conclusions about the effectiveness of Take it personal!.

6

CHAPTER

The effectiveness of an indicated prevention program for substance use in individuals with mild intellectual disabilities and borderline intellectual functioning: results of a quasi-experimental study

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Abstract

Aims To assess the effectiveness of Take it personal!, a prevention program for individuals with mild intellectual disabilities and borderline intellectual functioning (MID-BIF) and substance use (SU). The prevention program aims to reduce SU (alcohol, cannabis and illicit drugs) among experimental to problematic substance users.

Design: A quasi-experimental design with two arms and a 3-month follow-up.

Setting: Adolescents were recruited from 14 treatment centers in the Netherlands specialized in offering intra- and extramural care for people with MID-BIF and behavioral problems. **Participants:** Data were collected from 66 individuals with MID-BIF assigned either to the intervention condition ($n = 34$) or to the control condition ($n = 32$).

Interventions: Take it personal! was designed to target four personality traits: sensation-seeking, impulsive behavior, anxiety sensitivity and negative thinking. For each of these profiles, interventions were developed that were structurally the same but contained different personality-specific materials, games and exercises. The control group received care as usual. **Measurements:** Primary outcomes at 3-month follow-up were frequency of SU, severity of SU and binge drinking.

Results: Results showed intervention effects for SU frequency ($F(1, 50.43) = 9.27, P = 0.004$) and binge drinking ($F(1, 48.02) = 8.63, P = 0.005$), but not for severity of SU ($F(1, 42.09) = 2.20, P = 0.145$).

Conclusions: A prevention program to reduce substance use among experimental to problematic users with mild intellectual disabilities and borderline intellectual functioning helped participants to decrease substance use frequency and binge drinking.

Introduction

Adolescents and young adults with mild intellectual disability [MID; intelligence quotient (IQ) range = 50–69] or borderline intellectual functioning (BIF; IQ range = 70–85) (American Psychiatric Association, 2013) are vulnerable to problems in different domains, such as mental, physical and socio-economic functioning (Didden, VanDerNagel, Delforterie, Van Duijvenbode, 2020; Van Duijvenbode, VanDerNagel, 2019). They are also at higher risk for substance use disorders (SUD) compared to their non-disabled peers (Van Duijvenbode, VanDerNagel, 2019; Emerson, Einfeld & Stancliffe, 2010). As with individuals without MID-BIF, substance use (SU) is common among individuals with MID-BIF and develops at a similar age (Taggart, McLaughlin, Quinn & Milligan, 2006; Van Duijvenbode et al., 2015; To, Neiryneck, Vanderplasschen, VanHeule & VanDerVelde, 2014). However, common consequences of SU, such as difficulties in day-to-day functioning at school, work or home, have more impact on individuals with MID-BIF than on non-disabled individuals (Didden et al., 2020; Van Duijvenbode, VanDerNagel, 2019), as SU is often inter-related with MID-BIF and behavioural problems (Didden et al., 2020; Van Duijvenbode et al., 2015). Various risk factors, including impairment in cognitive and social skills, inhibition problems, deficits in coping skills and susceptibility to peer pressure account for the increased risk for SUD in individuals with MID-BIF (Didden et al., 2020; Van Duijvenbode et al., 2015). Clearly, there is a great need for effective prevention programs for people with MID-BIF before SUD emerges (Didden et al., 2020; Van Duijvenbode et al., 2015; Kiewik, VanderNagel, Engels & de Jong, 2017).

Prevention programs for the general population are not suitable for the complex nature of SU observed among individuals with MID-BIF and the support they receive from these programs is only minimal, because of their intellectual disabilities and problems with social adaptability (Didden et al., 2020; Kerr, Lawrence, Darbyshire, Middleton & Fitzsimmons, 2013). SU prevention programs are often less accessible to individuals with MID-BIF and typically are poorly adapted to their cognitive level (Didden et al., 2020; Van Duijvenbode et al., 2015; Kiewik et al., 2017; Kerr et al., 2013). Programs that have demonstrated effectiveness in individuals without intellectual disability need to be adapted to the needs and learning style of individuals with MID-BIF (Conrod et al., 2013; Lammers et al., 2013; Mahu, Doucet, O’Leary-Barrett & Conrod, 2015). A few prevention programs have been developed particularly for people with MIDBIF, but evidence of their effectiveness is still weak (Kiewik et al., 2017; Kerr et al., 2013). A recent review of the literature on SU prevention programs for this group found only six studies, including two randomized controlled trials on the effectiveness of programs (Kiewik et al., 2013). These

studies, however, did not demonstrate intervention effects on reducing SU (Kiewik et al., 2013). These programs are often too short and do not consider the complex nature of SU among individuals with MIDBIF. In addition, existing prevention programs are aimed at a broad heterogeneous group of individuals with MID-BIF. Clearly, there is a need for prevention programs for this specific high-risk target group. To provide each individual with MID-BIF appropriate intervention, a high level of customization is necessary (Kiewik et al., 2013). As such, personality-targeted prevention programs have been shown to be effective in reducing SU among adolescents without MID-BIF (Conrod et al., 2013; Lammers et al., 2015; Mahu et al., 2015), and are referred to as the most appropriate SU prevention strategy for high-risk groups (Sher, Bartholow & Wood, 2000).

These personality-targeted prevention programs are based on four personality profiles: sensation-seeking, impulsivity, anxiety sensitivity and negative thinking (SS, IMP, AS and NT, respectively) (Woicik, Stewart, Phil & Conrod, 2009). These profiles have been associated with risky SU in the general population (Lammers et al., 2015; Sher et al., 2000; Conrod, Stewart, Comeau & Maclean, 2006) and in individuals with MID-BIF (Poelen, Schijven, Otten & Didden, 2017). Each personality profile has its own patterns and motives for SU. Individuals with externalizing profiles (sensation seeking and impulsivity) tend to be vulnerable to positive reinforcement and positively rewarding effects of substances (Conrod et al., 2006). Individuals with internalizing personality profiles (anxiety sensitivity and negative thinking) use SU as an emotion regulation strategy to deal with negative feelings (Comeau, Stewart & Loba, 2001; Cooper, Frone, Russell & Mudar, 1995).

Take it personal! is an indicated prevention program for adolescents and young adults (aged 14–30 years) with MID-BIF and SU. The program aims to reduce SU (alcohol, cannabis and illicit drugs) among experimental to problematic substance users. Take it personal! is based on the theoretical underpinnings of effective personality-targeted prevention programs (Conrod et al., 2013; Lammers et al., 2015; Mahu et al., 2015). Moreover, the intervention is based on the principles of motivational interviewing (MI) and cognitive behavioral therapy (CBT), both of which have demonstrated effectiveness in decreasing alcohol and drug use among non-disabled adolescents (Davis et al., 2015; Smedslund et al., 2011), and in adapted form they are also effective in people with MID-BIF (Vereenoghe & Langdon, 2013; Frielink & Embregts, 2013). Another technique that has been used especially for the target group is psychomotor therapy, a complementary less verbal therapy based on exercises and practice in movement and body experience. Psychomotor therapy is commonly used and shows promising results in behavior intervention for individuals with MID-BIF (Bellemans et al., 2017). The aim of the present

study was to examine the effectiveness of Take it personal! on reducing the frequency and severity of SU (alcohol, cannabis and illicit drugs) among adolescents and young adults with MID-BIF.

Method

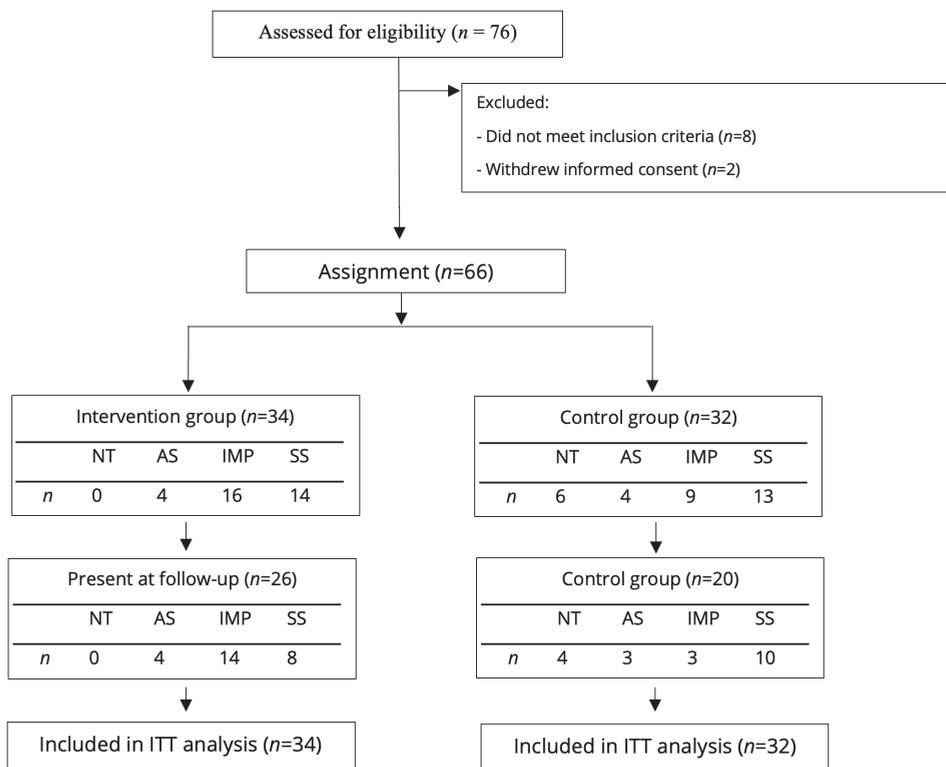
Design

This study was originally set up and registered as a randomized controlled trial (Schijven, Engels, Kleinjan & Poelen, 2015). However, the design was changed to a quasi-experiment with two arms, because individual or cluster randomization was not possible. Adolescents with MID-BIF were screened at baseline and subsequently assigned to either the intervention condition (Take it personal!) or the control condition; follow-up measures were assessed after 3 months. Participants in the control condition received care as usual, which was neither standardized nor protocolled, and they were free to attend other programs and/or therapies for their own specific problems (information concerning type of care was not assessed).

Participants

A total of 76 adolescents with MID-BIF were recruited from 14 treatment centers in the Netherlands specialized in offering intra- and extramural care for people with MID-BIF and behavioral problems. All participants received treatment because of their behavioral problems, such as aggression, criminal behavior or internalizing problems. Inclusion criteria were: (1) life-time prevalence of alcohol, cannabis or illicit drug use, (2) belonging to one of the four personality high-risk groups (SS, IMP, AS or NT) and (3) providing signed informed consent along with the signed informed consent from parents or a legal representative. A contraindication was moderate to severe SUD according to the DSM-5 (APA, 2013), because these problems require more intensive treatment programs (McHugh, Hearon & Otto, 2010). Overall, 66 adolescents (47 male) from 11 treatment centers met these criteria, and they were assigned to either the intervention or control condition (Fig. 1). Participants in the intervention condition attended Take it personal! in eight groups of three to four adolescents. The average (and median) cluster size was seven participants per treatment center (ranging from two to 14 per treatment center).

Figure 1. Flow diagram of enrolment and retention by treatment arm.



Procedure

Treatment centers were informed about the prevention program and were invited to participate in this study. Adolescents who were found to be eligible to participate were then approached by their care-giver or clinician who invited them to participate. Upon registration, adolescents were pre-screened and sex and date of birth were registered using self-reported questionnaires (see Outcome measures). The questionnaires included pictograms and images administered via a web-application on a tablet computer that adolescents operated themselves. A researcher read every question aloud and, if necessary, provided further clarification with simple wording. An adolescent's personality profile (SS, IMP, AS or NT) was determined according to the highest score on the Substance Use Risk Profile Scale (SURPS) (Woicik et al., 2009). If more than one high-risk personality profile was identified in one adolescent, the independent researcher contacted that adolescent's clinician and appealed to his/her clinical experience to determine the profile

that explained the adolescent's SU the most clearly. In addition, case files were used to collect information about IQ (measured with the WAIS or WISC). These files include recent and relevant information concerning the client (never older than approximately 2 years).

An independent researcher assigned adolescents to the intervention and control conditions based on participants' numbers, their treatment center and their personality profile. Individual or cluster randomization was not possible with regard to the number of available treatment centers and participants and the fact that the prevention program required a group of three or four adolescents with the same personality profile. Furthermore, groups comprised adolescents who were already receiving treatment in the same treatment center. This was conducted to lower the threshold for participation, as travelling between treatment centers on a weekly basis would cause too much inconvenience for adolescents and care-givers. Hence, adolescents within the same treatment center were assigned either to the control condition or to the intervention condition. Adolescents and parents (or legal representatives) were informed that the intervention was designed to reduce problems with alcohol and drug use and that their data would be processed anonymously. For each measurement, the participants received a €5 gift card. Data were collected between January 2015 and April 2017. Both adolescents and parents provided active informed consent. The Ethics Committee of Radboud University approved this study (ECSW2015-0903-303), and the trial was registered at the Dutch Trial Register (NTR5037; 15 April 2015).

Intervention

The prevention program comprised five 45-minute group sessions and five 30-minute individual sessions conducted within a 6-week time-span. For each of the four personality profiles (SS, IMP, AS and NT), specific interventions were developed that were structurally the same but contained different personality-specific materials, games and (psychomotor therapy) exercises. Trainers were a psychologist and psychomotor therapist from the participant's own treatment center, who had received specific training on *Take it personal!* prior to the start of the study, including training in MI, CBT and the theoretical background of the program. Both trainers conducted the group sessions together, and for the individual sessions the adolescents were equally allocated to one of the two trainers. In each individual session, adolescents could bring a confidant from their team of care-givers at their treatment center with whom they were familiar. This was conducted to maximize the transfer of training to daily life situations and to ensure that adolescents felt safe and prepared for the group sessions.

Take it personal! comprised three main components: (1) psycho-education about the participants' personality profile and related problematic coping behavior, (2) training of behavioral coping skills and (3) training of cognitive coping skills to cope with personality-related thoughts and behaviors resulting in problematic behavior. MI, CBT and psychomotor therapy were used to deliver these components. Although the prevention program could target any SU (alcohol, cannabis, illicit drugs), adolescents set personalized goals and edited a personal 'changing plan' to deal with their own problematic behaviors and SU. Hence, in practice, the prevention program addressed the use of substance(s) that was/were most problematic for the individual. The content of Take it personal! is described in more detail in the intervention mapping paper (Schijven, VanDerNagel, Otten, Lammers & Poelen, 2021). Program fidelity was assessed in evaluation forms completed by trainers after the prevention program. Overall, evaluation shows that the program was reported to be delivered as protocolled.

Outcome measures

Baseline assessment

For baseline screening, the 23-item SURPS (Woicik et al., 2009) was used to distinguish the four high-risk personality profiles for SU. Items were measured on a four-point Likert scale that ranged from (1) 'strongly agree' to (4) 'strongly disagree'. To adapt the SURPS to adolescents with MID-BIF, the wording of some items was simplified and response options were complemented with pictograms of thumbs-up and thumbs-down. The SURPS has been validated for use with people with MID-BIF (Poelen et al., 2017). In the current sample, the SURPS demonstrated an acceptable internal consistency, with Cronbach's $\alpha = 0.71$ for AS, 0.87 for NT, 0.62 for IMP and 0.67 for SS.

Primary outcomes

Substance use frequency

One item from the Substance Use and Misuse in Intellectual Disability Questionnaire (SumID-Q) (VanDerNagel, Kiewik, van Dijk, de Jong & Didden, 2011) was used to measure the frequency of SU, assessing three substances separately. Adolescents answered the questions: 'How often do you drink alcohol/smoke weed/do hard drugs?', with answer categories ranging from (1) 'never' to (5) 'almost every day'. In contrast to the original design (Schijven et al., 2015), we did not use life-time use of cannabis and illicit drugs (i.e. assessed with the item: 'Have you ever used weed/illicit drugs (1) 'yes' (2) 'no') as primary outcomes.

At baseline, 85% of our participants showed life-time use of cannabis and 58% showed life-time use of illicit drugs; examining change on these measures would not be useful.

Substance use severity

To assess the severity of SU, the Alcohol Use Disorders Identification Test (AUDIT) (Babor, Higgins-Biddle, Saunders & Monteiro, 2001) and the Drug Use Disorders Identification Test (DUDIT) (Berman & Bergman, 2003), as incorporated in the SumID-Q, were used. Each scale consisted of 10 items that could be rated on a five-point Likert scale, with answer categories ranging from (1) 'never' to (5) 'almost every day'. The AUDIT and DUDIT items relate to frequency and quantity of use, dependency and problems related to use. An example is: 'How often could you not stop drinking/drug use?'. The AUDIT and DUDIT have been shown to be applicable in people with MID-BIF (Van Duijvenbode, Didden, Korzilius & Engels, 2016). In the current sample, both AUDIT and DUDIT showed good internal consistency, with Cronbach's $\alpha = 0.75$ for the AUDIT and $\alpha = 0.81$ for the DUDIT.

Binge drinking

The frequency of binge drinking was assessed with one item from the Alcohol Use Disorders Identification Test (Babor et al., 2001) of the SumID-Q (Berman & Bergman, 2003). Adolescents replied to the question: 'How often do you drink more than six glasses on one occasion?'; the answer categories ranged from (1) 'never' to (5) 'almost every day'.

Statistical analyses

Sample size calculation was based on a previous personality-targeted intervention study with a medium effect size (Conrod et al., 2006). Power-analysis based on an average effect size of $F = 0.25$ (Conrod et al., 2006), a two-sided test at $\alpha = 0.05$, a statistical power ($1 - \beta$) of 0.80 and 10% loss-to follow-up after randomization. Based on these assumptions, a sample size of 140 adolescents was required (Schijven et al., 2015). In the Results section we elaborate on power and effect size calculations.

Descriptive analyses were performed to examine baseline distributions of age, gender, total IQ and outcome measures among adolescents in the intervention and control groups. Because Take it personal! was personalized and aimed to teach adolescents skills to reduce the most relevant substance(s), effectiveness was assessed for each adolescent's most frequently or severely used substance and compared at baseline and follow-up. If more than one substance was equally frequently or severely used at

baseline, then the average baseline and follow-up scores for these substances were compared. For example, if a person used alcohol and cannabis daily at baseline and other drugs monthly, then the baseline score for frequency of alcohol and cannabis [(5), 'almost every day'] was compared to the average frequency score for alcohol and cannabis at the follow-up measurement. Additionally, we assessed intervention effectiveness for each substance separately. All analyses were performed using R version 3.6.1 (R Core Team R, 2017).

Mixed-effects regression models were used to test the effect of Take it personal! on SU frequency, SU severity and binge drinking. Time, condition and time \times condition interaction were entered as fixed effects in the models. The intervention effect was estimated by the interaction effect on each dependent variable. Time was centered and sum-to-zero contrasts were used. To correct for data clustering at baseline, each model included random intercepts for participant, gender and treatment centers. Random slopes were added to the models to control for a clustered effect of time (i.e. the change between baseline and follow-up) within gender and treatment centers. Graphical model diagnostics plots (Bates, Mächler, Bolker & Walker, 2015) were visually inspected to assess goodness of model fit. Attrition analysis by means of logistic regression and Little's MCAR test indicated that values were missing completely at random, warranting the use of a multiple imputation strategy for intention-to-treat analyses. To obtain *P*-values, conditional *F*-tests were performed on both models using the Kenward–Roger approximation for degrees of freedom, a method that gives the most optimal type I error rates in linear mixed-effects models (Nakagawa & Schielzeth, 2013).

Results

Characteristics of the participants

Participant characteristics are displayed in Table 1. Adolescents in each group did not significantly differ in age, IQ, all outcomes of SU frequency or drug use severity at baseline. However, the groups differed significantly in gender, alcohol use severity and binge drinking. Overall, 24% of the adolescents were frequent alcohol users, reporting weekly or daily alcohol consumption at baseline, 41% used cannabis weekly or daily and 20% used illicit drugs weekly or daily. In total, 23% of the adolescents were weekly or daily poly-users of more than one substance.

Table 1 Adolescents' demographics and outcome characteristics.

	Total sample	Intervention	Control	t/χ^2	df	p
Demographics						
Age (M, SD)	17.45 (2.76)	17.21 (2.67)	17.72 (2.88)	-0.75	64	0.455
Total IQ (M, SD)	73.68 (7.92)	72.39 (9.13)	74.85 (6.91)	0.94	30.86	0.329
Gender (n male, %)	47 (71%)	20 (59%)	27 (84%)	3.20	1	0.043*
Outcomes						
Baseline alcohol use frequency (M, SD)	2.71 (1.06)	2.92 (1.14)	2.50 (0.95)	1.59	64	0.117
Follow-up alcohol use frequency (M, SD)	2.41 (0.72)	2.31 (0.69)	2.52 (0.75)	1.23	64	0.225
Baseline cannabis use frequency (M, SD)	2.98 (1.52)	3.26 (1.52)	2.69 (1.49)	1.55	64	0.125
Follow-up cannabis use frequency (M, SD)	2.51 (1.06)	2.34 (0.95)	2.69 (1.15)	1.32	64	0.191
Baseline other drug use frequency (M, SD)	1.97 (1.64)	2.17 (1.78)	1.75 (1.48)	1.05	64	0.296
Follow-up other drug use frequency (M, SD)	1.82 (0.92)	1.66 (0.87)	1.98 (0.96)	1.46	64	0.148
Baseline substance use frequency [†] (M, SD)	3.58 (1.10)	3.82 (1.05)	3.31 (1.09)	2.16	64	0.058
Follow-up substance use frequency [†] (M, SD)	2.59 (0.90)	2.42 (0.91)	2.78 (0.86)	1.68	64	0.097
Baseline alcohol use severity (M, SD)	8.12 (6.12)	10.02 (6.72)	6.09 (4.72)	2.74	64	0.008**
Follow-up alcohol use severity (M, SD)	6.27 (3.76)	6.74 (4.20)	5.78 (3.21)	-1.03	64	0.306
Baseline drug use severity (M, SD)	10.83 (9.44)	12.02 (10.33)	9.56 (8.35)	1.06	64	0.292
Follow-up drug use severity (M, SD)	7.63 (5.95)	7.80 (6.01)	7.45 (5.97)	-0.24	64	0.813
Baseline substance use severity ^{††} (M, SD)	13.32 (8.22)	15.24 (8.63)	11.28 (7.35)	2.13	64	0.050
Follow-up substance use severity ^{††} (M, SD)	8.43 (5.39)	7.52 (5.39)	7.99 (5.37)	-0.68	64	0.498
Baseline binge drinking* (M, SD)	2.02 (0.92)	2.32 (1.06)	1.67 (0.60)	3.02	52.24	0.004**
Follow-up binge drinking* (M, SD)	1.77 (0.62)	1.67 (0.56)	1.86 (0.68)	1.22	64	0.226

* $p < .05$. ** $p < .01$. Total sample $n = 66$, intervention group $n = 34$, control condition $n = 32$. [†] The three primary outcome variables. ^{††} The frequency/severity of each adolescent's most frequently/severely used substance at baseline. Outcomes on frequency and binge drinking are group averages on a 5-point Likert scale with (1) 'never', (2) 'less than once a month', (3) 'every month', (4) 'almost every day', (5) 'almost every day'. Severity scores reflect the group average of AUDIT and DUDIT which is a sum-score of 10 items with this 5-point Likert scale. Follow-up are based on (in part) imputed data at 3-months post intervention.

Intervention effects on SU frequency, SU severity and binge drinking

Table 2 and Fig. 2 present the intervention effects (bivariate correlations are shown in the appendix). Visual inspection of model diagnostics plots reveals good model fit for all models without violations of statistical assumptions. The results showed a stronger decrease in SU frequency in the intervention condition compared to the control condition, as the interaction time \times condition was significant, $F(1, 50.43) = 9.27, P = 0.004$. Similarly, a stronger decrease in binge drinking was found for adolescents in the intervention condition compared to those in the control condition, $F(1, 48.02) = 8.63, P = 0.005$. For SU severity, the interaction time \times condition was not significant, $F(1, 42.09) = 2.20, P = 0.145$, indicating no differences between conditions over time on adolescents' most severely used substance at baseline. Intervention effects were thus found for SU frequency and binge drinking, but not for SU severity.

Intervention effects per substance

Table 2 presents effects of frequency and severity on individual substances. These additional analyses on separate substances reveal, in addition to intervention effects on alcohol and cannabis frequency, a stronger decrease in the severity of alcohol use in the intervention group compared to the control group, $F(1, 48.26) = 5.37, P = 0.025$.

Table 2 *Fixed effects parameters of linear mixed-effects models assessing intervention effectiveness on different outcome variables.*

Outcome variable	Condition				Time				Condition \times Time			
	<i>n df</i>	<i>dn df</i>	<i>F</i>	<i>p</i>	<i>dn df</i>	<i>F</i>	<i>p</i>	<i>dn df</i>	<i>F</i>	<i>p</i>		
Substance use frequency [±]	1	54.52	0.33	0.744	0.94	5.33	0.279	50.43	9.27	0.004**		
Alcohol use frequency	1	42.09	0.25	0.618	0.61	1.96	0.485	48.53	4.15	0.047*		
Cannabis use frequency	1	63.11	2.13	0.149	0.95	0.98	0.509	54.54	13.56	<0.001***		
Other drug use frequency	1	60.66	0.58	0.458	1.12	1.18	0.448	54.95	2.88	0.096		
Substance use severity [±]	1	42.09	1.81	0.357	0.39	22.87	0.366	42.09	2.20	0.145		
Alcohol use severity	1	45.14	4.28	0.044*	1.22	3.32	0.284	48.26	5.37	0.025*		
Drug use severity	1	45.02	0.55	0.462	0.38	6.55	0.463	42.09	1.22	0.275		
Binge drinking [†]	1	50.04	1.23	0.600	1.17	1.00	0.491	48.02	8.63	0.005**		

* $p < .05$. ** $p < .01$. *** $p < .001$. † The three primary outcome variables. ± The frequency/severity of each adolescent's most frequently/severely used substance at baseline. Condition is the between-subject factor distinguishing those in intervention and control condition. Kenward-Roger approximation for degrees of freedom was used. *n df* = numerator degrees of freedom. *dn df* = denominator degrees of freedom.

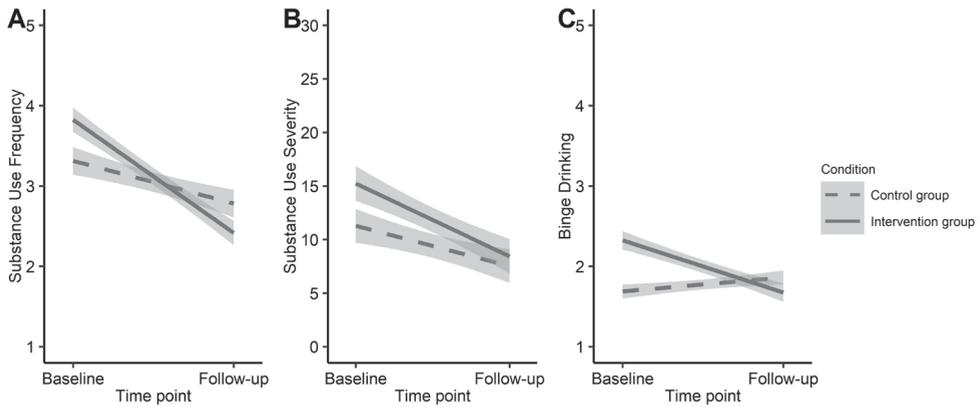


Figure 2. Interaction plot for intervention effects on A) substance use frequency, B) substance use severity, C) binge drinking. Grey bars reflect 95% confidence intervals. Y-axis indices on Graph A and C reflect frequency scores on a five-point scale with categories (1) 'never', (2) 'less than once a month', (3) 'every month', (4) 'every week', (5) 'almost every day', while Y-axis indices in Graph B reflect the sum score of 10 items with these 5-point scales assessing severity of alcohol (AUDIT) or drug (DUDIT) use. Graph A is the frequency of the substance(s) (alcohol and/or cannabis and/or other drugs) that each adolescent most frequently used at baseline. Graph B reflects the severity each adolescent's most severely used substance (alcohol or drugs) at baseline. Graph C reflects the frequency with which adolescent consume more than six glasses of alcohol per day

Power and effect size

Results should be seen in the light of our sample size ($n = 66$), that was smaller than intended (Babor et al., 2001). Nevertheless, post-hoc power analyses using 100 Monte Carlo simulations revealed a 90, 45 and 85% chance of finding a statistically significant effect ($\alpha = 0.05$) for the interaction time \times condition in models for, respectively, SU frequency, SU severity and binge drinking. Marginal R^2 (Cohen, 1988) was 0.16, 0.13, 0.17 for the combined fixed effects in models for, respectively, SU frequency, SU severity and binge drinking, reflecting the medium effect sizes (Cohen, 1988) we aimed for with our a priori power analysis.

Discussion

This study evaluated the effectiveness of Take it personal!, an indicated prevention program for SU (alcohol, cannabis, illicit drugs) in adolescents with MID-BIF. Intervention effects were found for SU frequency and binge drinking, but not for SU severity. Results on specific substances reveal a nuance to the latter, as the intervention showed effectiveness for severity of alcohol use, indicating that adolescents whose drug use was most problematic were able to reduce the severity of alcohol use at 3-month follow-up, but not the severity of

drug use. Our results were consistent with the effectiveness studies of personality-targeted SU prevention programs for non-disabled adolescents that showed intervention effects for alcohol use frequency (Bates et al., 2015; Conrod, 2016), binge drinking (Conrod et al., 2013; Conrod, Castellanos & Mackie, 2008) and cannabis use (Mahu et al., 2015; Newton et al., 2018) over periods of 4–6 months in British, Canadian and Australian adolescents. Moreover, other studies on the severity of use did not find intervention effects on problematic drinking in Dutch and British adolescents (Lammers et al., 2015; Conrod et al., 2008). However, a Canadian study found a significant reduction in symptoms of problematic drinking in the short (4months) and long term (24months) (Conrod, Castellanos & Mackie, 2011). Take it personal! mainly helped adolescents to decrease their alcohol, cannabis or illicit drug use frequency, but this decrease was only reflected in a decrease of severity of alcohol use and not in a decrease of severity of cannabis and illicit drug use. Indicators of SU severity are—in addition the frequency of SU—symptoms of dependence and problems related to use (Babor et al., 2001, Berman & Bergman, 2003). Most participants in our study participated in Take it personal! for help with their problematic cannabis use (although often in combination with alcohol or illicit drug use). For this reason, it can be expected that problems related to cannabis are more persistent and more difficult to change than problems related to alcohol use in this particular group. A decrease of drug use dependence symptoms and problems may very well follow after a longer period of decreased SU frequency.

Limitations

The current study has some limitations. First, participants were assigned to the intervention and control condition based on treatment center. The absence of participant randomization between conditions may have influenced the results. Secondly, in our study the personality profiles sensation-seeking and impulsive behavior were overrepresented. Adolescents in our sample often obtain high scores on more than one personality profile, and in most cases SU was attributed to the externalizing profiles, as internalizing profiles might stand out less. Moreover, trainers speculated that adolescents with anxiety sensitivity- or negative-thinking profiles have less motivation to participate in a prevention program for SU and effectiveness study. There are different reasons why adolescents with anxiety sensitivity or negative thinking have less motivation to participate. Research suggests that the presence of anxiety sensitivity or depression affects motivation in general, and more specifically motivation and adherence to interventions due to a variety of client-related factors such as illness beliefs and attitudes (Lingam & Scott, 2002). In a similar vein, adolescents with negative and anxious personalities may find it harder to be motivated to participate in our study. Thirdly, in this study we only investigated short-term intervention effects.

Although the initial plan was to also conduct long-term assessments of the effects, for practical reasons (e.g. clients leaving the treatment facility) this appeared to be impossible. Therefore, it was not possible to draw conclusions concerning the long-term effects of the intervention. Future studies should focus on long-term effects of Take it personal!.

This study shows that cannabis use is the most significant problem in adolescents with MID-BIF, and clinicians from several treatment centers confirmed that cannabis contributes to the greatest problems in the daily life of our target population. Most participants in our study were enrolled into the prevention program for problems related to cannabis use. Take it personal! showed to be effective in reducing SU frequency in this specific group. Although clinicians from several participating treatment centers confirmed that cannabis contributes to the greatest problems in the daily life of our participants, we also know that alcohol use is known to be severely underestimated by staff and often not seen as a big problem. Moreover, in this study, we did not reach the planned number of participants (Schijven et al., 2015), while previous personality-targeted SU interventions recruiting from school settings for adolescents without disabilities did not face difficulties with inclusion (Conrod et al., 2013; Lammers et al., 2015). Difficulties in our study were related to the complexity of the clinical population of adolescents with MID-BIF and behavioral problems. These adolescents are often in need for interventions for multiple problems besides substance use, such as behavioral problems and trauma. Timing of interventions is crucial with regard to compliance, motivation and readiness to change. In addition, Take it personal! intervention groups were composed based on personality profile. It often occurred that timing for several individuals was right to start Take it personal!, but that personality profiles did not match and that intervention groups could not start. Moreover, participants dropped out because they moved away from the treatment center or were simply not motivated to complete follow-up questionnaires. Adolescents with MID-BIF, as well as clinical MID-BIF practice, may benefit from a more personalized study approach, so future studies could focus on $n = 1$ research to determine if and how the intervention works for each adolescent.

Conclusion

In summary, Take it personal! seems to fill the gap of effective SU prevention programs in treatment services for the high-risk target group on individuals with MID-BIF. Instead of treating adolescents as uniform, Take it personal! seems to address the individual needs of members of this complex target group by offering a personalized prevention program. The approach of Take it personal! strengthens efforts to reduce SU among adolescents with MID-BIF and intervene before SUD emerges.

CHAPTER

General discussion

7

This thesis focuses on the prevention of substance use disorders among adolescents and young adults with MID-BIF. Individuals with MID-BIF are at increased risk of developing a substance use disorder compared to those without MID-BIF and are more vulnerable for the adverse effects of substance use disorder (Duijvenbode & VanderNagel, 2019; Didden et al., 2020). This stresses the need for the development of an indicated prevention program for this target group, especially one adapted to their complex needs (Duijvenbode & VanderNagel, 2019; Carrol Chapman & Wu, 2012; McGillicuddy, 2006). Because intervening *before* substance use disorders emerge is always better than treating the issue when it does occur, it is paramount to develop an evidence-based intervention adapted to the complex needs of this target group. The current thesis contributes to this need and describes the complexity and risk factors of this target group, as well as it discusses the development and results of an effectiveness study of an indicated prevention program for individuals with MID-BIF, substance use and comorbid behavioral problems.

The general discussion starts with a summary of the main findings divided into two parts. The first part of the thesis describes characteristics and risk factors in individuals with MID-BIF and substance use. Personality profiles have been found to be associated with substance use among individuals with average intelligence, up until now it was unclear whether that also applied to individuals with MID-BIF. The same goes for motives for substance use. In the second part, the development and results of an effectiveness study of *Take it personal!* are described. Further, we reflect on these main findings and implications for clinical practice will be discussed. Finally, limitations of the current thesis are described, followed by suggestions for future research on improving systematic screening for this target group, as well as the development and evaluation of prevention programs.

Summary of the main findings

Part 1: Cross-sectional relations between motives for substance use, personality profiles and substance use among individuals with MID-BIF.

Table 1 presents the main findings of this thesis. In this thesis the theory that personality traits are vital in understanding substance use plays a central role. Studies have distinguished four personality profiles based on impulsivity, sensation seeking, anxiety sensitivity and negative thinking, all of which are known to be associated with substance use (disorders) in the general population (Conrod, Comea, & Maclean, 2006; Woicik, Stewart, Phil, & Conrod, 2009). In **chapter 2**, we examined the relationship between the

four personality profiles and substance use among individuals with MID-BIF. Data were collected from 118 persons (mean age 20.5 years) with MID-BIF and severe behavioral problems using interactive questionnaires with visual cues on a tablet with a web application. In addition, we tested the level of ID in the relationship of the personality profiles and severity of alcohol use and drug use. We found no significant relationship between level of ID and the four personality dimensions, indicating that personality dimensions were not different between individuals with mild ID than those with borderline ID. In addition, findings showed that individuals who scored high on negative thinking, impulsivity and sensation seeking showed more severe alcohol use. Individuals with high scores on negative thinking and sensation seeking showed more severe levels of drug use. The results of this study are generally in line with existing literature on personality dimensions in individuals with an average intelligence, indicating that these personality dimensions are predictive in individuals who are at higher risk for developing problematic substance use. The results of this study emphasize the importance of including these personality dimensions into adapting interventions for this target group and develop these interventions with a more personality-targeted approach.

In **chapter 3**, we examined the relationship between drinking motives (i.e., social, conformity, coping and enhancement) and substance use among individuals with MID-BIF. Data were collected from 163 individuals (mean age 18.9 years) with MID-BIF and severe behavioral problems. We found that alcohol use positively relates to social motives of substance use; this is in line with previous findings among non-disabled individuals that social motives are related to the non-problematic use of alcohol (Cooper, 1994; Mezquita, Stewart & Ruipérez, 2010). Similarly, light alcohol use is socially accepted and goes hand-in-hand with healthy social relationships. In addition, we discovered that coping, enhancement and conformity motives were positively related to the severity of alcohol use. It can be concluded that both coping and enhancement motives pose a risk for problematic use of alcohol in people with MID-BIF. In accordance with findings concerning the frequency of alcohol use, this study showed that social motives are positively related to the frequency of cannabis and illicit drug use in people with a MID-BIF. For problematic drug use, coping motives were most dominant. These insights can contribute to prevention efforts or the reduction of problematic substance use in people with MID-BIF and have implications for both policies in clinical practice and for interventions for prevention and treatment in substance use. The results of this study stress the importance of including motives into personalized interventions for people with MID-BIF and substance use instead of using a 'one-size fits all' approach. In addition, our results reveal that many people with MID-BIF in residential care are at risk of problematic substance use.

Part 2: Development of Take it personal! and investigation of effectiveness.

Chapter 4 describes the study protocol of the effectiveness study of Take it personal!. Although the design was changed into a quasi-experimental design later in time, the original design of the study was planned as a randomized controlled trial among 14-21-year old adolescents with MID-BIF and behavioral problems admitted to treatment facilities in the Netherlands. Inclusion criteria were previous substance use and personality risk profile for substance use. Participants were individually randomized to the intervention ($n = 70$) or control ($n = 70$) groups. The intervention group was exposed to six individual sessions and five group sessions carried out by two qualified trainers over a six-week period. Primary outcomes were the reduction in substance use (for alcohol: binge drinking, frequency of use and problematic use; for cannabis: frequency of use; for other illicit drugs: frequency of use; and for all drug use: problematic use). All outcome measures were assessed after two, six, and twelve months after the intervention.

In **chapter 5**, the development of Take it personal! was described by means of the Intervention Mapping (IM) protocol. In addition, a small modelling study was conducted with six adolescents to examine the feasibility, user-friendliness and potential effectiveness of the intervention. Take it personal! is an indicated prevention program for adolescents with MID-BIF that aims to reduce their substance use; it is based on the four personality profiles that are vital in understanding substance use (disorders) in the general population (Conrod, Comea, & Maclean, 2006; Woicik et al., 2009) and among individuals with MID-BIF (**Chapter 2**; Poelen, Schijven, Otten & Didden, 2017; Pieterse, VanDerNagel, Ten Klooster, Turhan & Didden, 2020). Based on the reports of trainers in the small modelling study, it was concluded that the intervention has good feasibility. Participants indicated that they liked the intervention, were satisfied with the design of the workbook, and that they had learned something from the intervention. As participants indicated that they reduced their substance use, the initial results on the potential effectiveness of the intervention were considered promising.

In **chapter 6**, the effectiveness of Take it personal! was examined in a study with a quasi-experimental design with two arms and a 3-month follow-up. To investigate the effectiveness of Take it personal!, the intention was to conduct an RCT, as discussed in **chapter 4**. However, we did not reach the original planned sample size, despite our efforts during the recruiting phase, see also limitations of this thesis in chapter 6 and in this discussion. Data were collected from 66 individuals with MID-BIF assigned either to

the intervention condition ($n = 34$) or to the control condition ($n = 32$). Results showed intervention effects on substance use frequency and binge drinking, but not on the severity of substance use, indicating that *Take it personal!* provides a potential response to the need for adequate interventions for substance use among individuals with MID-BIF. The intervention is unique in that it targets individuals with high risk personality profiles, thereby offering more tailored treatment, meaning *Take it personal!* better fits the special needs of this complex target group. This suggests that using targeted approaches, such as targeting personality profiles, may be a well suited substance use prevention strategy for high-risk youth.

In addition, with regard to prevalence, in different studies in this thesis (**chapter 2, 3 and 6**), we found a high prevalence of substance use in adolescents and young adults with MID-BIF. In the paper presented in **chapter 2 and 3**, we identified high rates of problematic alcohol and drug users. In total, 41% of the participants scored above the cut-off criterion for problematic use (a score of 8 or higher) on the AUDIT, and 45% ($n = 73$) met the cut-off criterion for problematic use (a score of 5 or higher) on the DUDIT. For both alcohol and drug use, 25% had a score above the cut-off point. Moreover, in **chapter 6**, 41% of the participants used cannabis on a weekly or daily basis, and 20% used other drugs weekly or daily, compared to 24% of the participants who were identified as a frequent alcohol user, either on a weekly or daily basis. In total, 23% of participants were weekly or daily poly-drug users (users of one or more substances), indicating that individuals with MID-BIF are at risk for problematic substance use.

Table 1 *Summary of the main findings*

Findings	Chapter
People with MID-BIF and behavioral problems are at risk for problematic substance use.	2, 3
Substance use among individuals with MID-BIF in our study is high.	
The SURPS personality dimensions identify persons at increased risk for substance use disorders.	2, 3, 6
Drinking motives are related to substance outcomes among individuals with MID-BIF.	3
Both coping and enhancement motives pose a risk for the problematic use of alcohol.	
For problematic drug use, coping motives are the most dominant.	
<i>Take it personal!</i> has good feasibility and is user-friendly according to participants and trainers.	5
<i>Take it personal!</i> is effective in decreasing substance use frequency and binge drinking.	6

Reflection of the main findings

Motives for substance use among individuals with MID-BIF

The high identified percentages of substance use and risk for substance use disorder in this thesis (chapter 2 and 3) are concerning. Motives for such use may be a potential focus for further research, and we think it provides direction for the further development of screening and treatment for this target group. As coping motives are strongly related to substance use, the question arises whether this is typical for individuals with MID-BIF or whether it is related to the fact that this group of people is at higher risk for developing comorbid psychopathology. People with psychiatric problems use substances more often to deal with their problems than people without psychiatric problems (Nouwens, Lucas, Smulders, Embregts & van Nieuwenhuizen, 2017; Kaptein, Jansen, Vogels, Reijneveld, 2008; Oeseburg, Jansen, Groothoff, Dijkstra & Reijneveld, 2010).

Cannabis use and the gateway effect

As discussed previously, the prevalence of cannabis use was high in our samples, as found in other studies (VanDerNagel, Kiewik, Buitelaar, de Jong, 2011). This could be caused by the clinical nature of our samples and the fact that all participants were associated with intra- or extramural care and levels of comorbid psychopathology were high. Adolescents in special education and residential youth care are known to have higher risk of substance use in general (Kepper, Eijnden, Monshouwer, & Vollebergh, 2014). Still, or perhaps because of this, this is a concerning finding. Individuals in residential care are vulnerable to developing all kinds of problems, including problematic substance use. When these youngsters show high levels of cannabis use, this may be even more concerning because of the potential of cannabis to function as a gateway drug, in which cannabis increases the risk of the use of more detrimental and more potent drugs.

According to the gateway hypothesis, initially developed by Kandel (1975), adolescents first begin using substances by consuming tobacco, then move on to cannabis and, finally, end up consuming other drugs (amphetamines, cocaine, heroin, LSD, or designer drugs). This so-called gateway effect has been studied over the years (DeSimone, 1998; Pacula, 1998; Beenstock & Rahav, 2002; Fergusson, Boden, & Horwood, 2006). Several studies have revealed evidence for this effect (Duarte, Escario & Molina, 2011). In the studies in our thesis (chapters 2 and 6), we found high prevalence rates of cannabis use. In light of the gateway effect this is concerning as -particularly in this population- individuals who use cannabis may be likely to develop worse problems concerning their substance

use like start using other illicit drugs. Because of these results and the gateway effect, caregivers and treatment centers should focus on policies aiming to reduce tobacco use rates, so the use of cannabis and more problematic substances decreases.

Personality traits and MID-BIF

This thesis provides a first step towards a more personalized approach to interventions and treatment for individuals with MID-BIF and substance use. The four personality profiles based on the SURPS have shown to be highly predictive of problematic substance use among individuals of average intelligence, and our research (**chapter 2**) shows that these personality profiles are as predictive among individuals with MID-BIF. A recent study of Pieterse and colleagues (2020) replicated our study and concluded that the SURPS seems suitable for research both within samples of individuals with MID and individuals with BIF, similar to our study. This supports the SURPS-approach in adapting interventions to decrease substance use among people with MID-BIF. This approach can be integrated even more in different interventions for substance use among individuals with MID-BIF with different levels of substance use and for individual or group interventions.

7

Limitations of this thesis

Is a RCT the most appropriate design for complex target groups?

The original plan in order to examine the effectiveness of Take it personal! was to establish a randomized controlled trial (RCT), as described in the study protocol in **chapter 5**. However, during the study we changed it to a quasi-experimental trial with two arms and a 3-month follow-up. Despite our efforts and the efforts of Take it personal! trainers we did not reach the sample size provided by the power analyses of the registered trial. The required sample size to detect a medium effect size was 140. This expected effect size was based on a non-clinical sample and the Take it personal! study sample was conducted in a clinical setting. Under real world conditions we did not reach the required number of participants due to existing difficulties with such a clinically complex population. These adolescents are often in need of interventions for multiple issues besides substance use, such as behavioral problems and trauma. The timing of the interventions is crucial with regard to compliance, motivation and readiness to change. In addition, Take it personal! intervention groups were composed based on personality profiles. Frequently, the timing for several individuals was right to start Take it personal!, but their personality profiles did not match and so intervention groups could not start. Moreover, participants dropped out because they moved away from the treatment center or were simply not

motivated to fill out the follow-up questionnaires. In addition, inclusion could not be fully randomized as personality profiles and group constellation at care facilities had to be taken into account. Working with a target group in high intensity and complex care the number of available treatment centers and participants was too small for individual or cluster randomization. Therefore we have changed the design from a RCT to a quasi-experimental study as an appropriate alternative to test effectiveness under these real world conditions.

Notwithstanding the value of Randomized Controlled Trials or studies that use a quasi-experimental designs, growing attention has been paid to alternative designs that might be more suitable to investigate interventions in a clinical setting (Kazdin, 2019). Single case experimental studies are an example of that, with multiple benefits in contrast to RCT's. Most importantly, single-case study designs allow for a more fine-grained and detailed documentation of the process underlying interventions on an individual level (Kazdin, 2019). Specifically, they show how and when changes occur, while conventional RCT's only show whether or not a change occurred. Participants in single case study designs form their own control group (i.e., moving from no treatment to treatment). Each participant can actively participate and nobody ends up in a control group which contributes to the motivation to participate. Finally, single case study designs allow for a lower number of participants than a RCT, which increases the feasibility of the study, particularly when it concerns complex populations.

Future directions

Long term effects

In our study, we focused on the short-term effects of Take it personal!. Effectiveness studies on interventions using the personality targeted approach in adolescents with average intelligence found significant intervention effects after 12- and 24-month follow-ups (Conrod, Castellanos & Mackie, 2011; Lammers et al., 2017). We did not examine the long-term effects of Take it personal!, in order to increase the odds for effectiveness it could be of consideration to add a booster session to the intervention. Studies have evidenced that individuals with MID-BIF have trouble retrieving and manipulating information (knowledge) from long-term memory (Água Dias, Albuquerque, & Simões, 2019; VanderMolen, Van Luit, Jongmans & Van der Molen, 2007). Furthermore, they have difficulties with self-regulatory skills such as reflecting on their own behaviors, thoughts and feelings (Dermitzaki, Stavroussi, Bandi, & Nisiotou, 2008). Because of this, they may react more often out of

impulse or automatic response (rather than after thoughtful consideration). Moreover, seeing connections between cause and effect, and (thereby) looking ahead and anticipating, is more difficult for them (Didden, Collin, & Curfs, 2008). Similarly, adolescents with MID-BIF have more difficulties with generalizing learned skills or knowledge to other people, places and/or situations that are not directly related to the situation in which they have acquired the skill or knowledge (Didden et al., 2008; Kleinert, Browder & Towles-Reeves, 2009). Consequently, it may be helpful for these individuals to repeat the things they have learned in the intervention and one or more booster sessions could be of great support to increase the transfer-of-training and the intervention effects in the long-term.

Future improvements of Take it personal!

The involvement of the social network of youngsters with MID-BIF is important to increase the generalization of the skills they learned in the intervention to other situations and environments (De Wit, Moonen & Douma, 2011; Orobio de Castro et al., 2008). When parents or other close ones are involved throughout the intervention, it is more likely that participants receive the appropriate support. When parents or other close ones are involved throughout the intervention, it is more likely that participants receive the appropriate support. Adolescents included in our study often have caregivers who are more lenient towards substance and drug use. Parents can learn to not use alcohol or any other substance in front of their children so it is easier for them to control their use. For this reason, we advise extra sessions with parents or other caregivers of the participants, in addition to the sessions for the participants themselves. Studies have shown that the effectiveness of treatment concerning substance use among adolescents improves when participants' families are involved (Hogue, Dauber, Bobek, Jensen-Doss & Henderson, 2019; Hogue, et al., 2017).

Implementation and practical implications

To improve the effectiveness of Take it personal!, it is crucial to have an implementation plan for each treatment center. Program effects have been shown to be up to three times higher when programs are well implemented (Durlak & DuPre, 2008). A strategic evidence-informed approach to implementing interventions will help maximize their impact (Donaldsen, Lloyd, Gabbe, Cook & Finch, 2017). A good implementation plan includes the documented steps the study trainers need to take to successfully complete the implementation activities. Trainers have to be motivated about the intervention and should transfer this motivation to the youngsters. Individuals with MID-BIF are not always

motivated to join (another) training session. Dropout from interventions among adolescents is a common problem, with dropout rates being as high as 50% (Connor, Carlsen, Chang, Daniolos, Findling, & Steiner, 2006). High dropout is often attributed to adolescents disliking the intervention (Kahn, Ducharme, Travers, & Gonzalez-Heydrich, 2009). Therefore, the program should be appealing and fun for the youngsters to join, so that they remain motivated throughout the sessions as motivation is an important predictor of intervention completion and effectiveness (Deci & Ryan, 2000). Hardly any research has been done into the effectiveness of substance use interventions for people with MID-BIF. In this study we see that *Take it personal!* is effective, the next step is to determine cost effectiveness. This research is important to establish the health benefits and avoidance of social costs of the intervention (e.g. higher healthcare costs due to aggravation of substance use and comorbid behavioral problems and thus social costs such as crime or unemployment).

A practical difficulty of *Take it personal!* was putting groups together of adolescents with the same personality profile. In different treatment centers there were, for example, five or six adolescents who met the inclusion criteria of *Take it personal!* and who were able and also motivated to join the intervention. In some cases, it was not possible to compose an intervention group out of three or four participants because all adolescents had a different personality profile. In these cases, a section of the participants could not join the intervention. As a consequence, some participants had to wait a few months until a group was formed. During this period, these participants lost the motivation to join an intervention at a later stage. The strength of *Take it personal!* is, among other things, the combination of individual and group sessions, because adolescents can relate to and motivate each other. Nevertheless, it is recommended to develop an individual version of *Take it personal!* alternative to groups sessions, so that even more youngsters can benefit from this tailored approach and not lose their motivation to change their habits on substance use.

General conclusion

The results of this thesis provide insights into the risk factors for substance use among adolescents with MID-BIF. Knowledge about personality profiles and associated motives behind the development of problematic substance use and substance use disorders is essential for effective indicated prevention. The personality-based approach seems to fit the complex needs of this high-risk population of MID-BIF adolescents and young adults, and offers a response to the need for adequate intervention of substance use among such individuals. The approach of *Take it personal!* decreases the frequency of substance use among adolescents with MID-BIF and intervenes before substance use disorders emerge.

CHAPTER

References

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- Água Dias, A. B., Albuquerque, C. P., & Simões, M. R. (2019). Memory and linguistic/executive functions of children with borderline intellectual functioning. *Applied Neuropsychology: Child*, 8(1), 76–87. <https://doi.org/10.1080/21622965.2017.1384924>
- American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders* (5th ed.). Washington DC: Author.
- Arnett, J. (1994). Sensation seeking: A new conceptualization and a new scale. *Personality and Individual Differences*, 16, 289-325.
- Babor, T., Higgins-Biddle, J. C., Saunders, J., & Monteiro, M. G. (2001). *The Alcohol Use Disorders Identification Test: Guidelines for use in primary care* (2nd ed.). Geneva: World Health Organisation.
- Baglio, F., Cabinio, M., Ricci, C., Baglio, G., Lipari, S., Griffanti, L., Preti, M., Nemni, R., Clerici, M., Zanette, M., & Blasi, V. (2014). Abnormal development of sensory-motor, visual temporal and parahippocampal cortex in children with learning disabilities and borderline intellectual functioning. *Frontiers in Human Neuroscience*, 15 (8), 806.
- Barrot, N. & Paschos, D. (2006). Alcohol-related problems in adolescents and adults with intellectual disabilities. *Current Opinion in Psychiatry*, 19, 481–485.
- Bartholomew, K., Parcel, G., Kok, G. S., & Gottlieb, N. (2001). *Intervention Mapping: Designing Theory- and Evidence-Based Health Promotion Programs*. Mayfield, Mountain View, CA.
- Bates, D., Mächler M., Bolker, B. M., & Walker S. C. (2015). Fitting linear mixed-effects models using lme4. *Journal of Statistics and Software*, 67, 1–48.
- Beenstock, M., & Rahav, G. (2002). Testing Gateway Theory: do cigarette prices affect illicit drug use? *Journal of Health Economics*, 21(4), 679–698. [https://doi.org/10.1016/s0167-6296\(02\)00009-7](https://doi.org/10.1016/s0167-6296(02)00009-7)
- Begg, C., Cho, M., Eastwood, S., Horton, R., Moher, D., Olkin, I., Pitkin, R., Rennie, D., Schulz, K. F., Simel, D., & Stroup, D. F. (1996). Improving the quality of reporting of randomized controlled trials. *The CONSORT statement*. *JAMA*, 276(8), 637–639. <https://doi.org/10.1001/jama.276.8.637>
- Bellemans, T., Didden, R., Van Busschbach, J. T., Hoek, P. T., Scheffers, M., Lang R. B., & Lindsay, W. R. (2019). Psychomotor therapy targeting anger and aggressive behaviour in individuals with mild or borderline intellectual disabilities: A systematic review. *Journal of Intellectual Developmental Disabilities*, 4, 121–130.
- Bentler, P. M. (1990). Comparative fit indexes in structural models. *Psychological Bulletin*, 107, 238–246.
- Bergsma, S. (2010). *De Substance Use Risk Profile Scale voor zwakbegaafde en licht verstandelijk gehandicapte mensen*. Master thesis, Universiteit Twente/ Tactus Verslavingszorg.
- Berman, A. H., Bergman, H., Palmstierna, T., & Schlyter, F. (2003). *DUDIT: The Drug Use Disorders Identification Test manual*. Stockholm: Karolinska Institutet, Department of Clinical Neuroscience.
- Blackwell, E., Conrod, P. J., & Hansen, N. (2002). Negative cognitions, hopelessness and depression related drinking motives [Summary]. *Alcoholism Clinical and Experimental Research*, 26, 27A.
- Bransen, E., Schipper, H., & Blekman, J. (2009). Middelengebruik door jongeren met een licht verstandelijke handicap. Een eerste verkenning van aard en omvang. [Substance use among adolescents with mild intellectual disabilities. A first exploration of nature and range]. *Verslaving*, 5, 37-49.
- Burgard, J. F., Donohue, B., Azrin, N. H., & Teichner, G. (2000). Prevalence and treatment of substance abuse in the mentally retarded population: An empirical review. *Journal of Psychoactive Drugs*, 32(3), 293-298.

- Carney, T., Johnson, K., Carrico, A., & Myers, B. (2020). Acceptability and feasibility of a brief substance use intervention for adolescents in Cape Town, South Africa: A pilot study. *International Journal of Psychology, 55*(6), 1016-1025.
- Carroll Chapman, S. L., & Wu, L. T. (2012). Substance abuse among individuals with intellectual disabilities. *Research in developmental disabilities, 33*(4), 1147-1156. <https://doi.org/10.1016/j.ridd.2012.02.009>
- Cassiani-Miranda, C. A., Quintero-Gómez, T. C., & Burbano, A. (2019). Pedophilia, Substance-use Disorder, and Intellectual Disability: A Case Report. *Addictive Disorders & Their Treatment, 18* (1), 58-62.
- Castellanos, N., & Conrod, P. (2006) Brief interventions targeting personality risk factors for adolescent substance misuse reduce depression, panic and risk-taking behaviours, *Journal of Mental Health, 15*(6), 645-658.
- Castellanos-Ryan, N., O'Leary-Barrett, M., Sully, L., & Conrod, P. J. (2013). Sensitivity and specificity of a brief personality screening instrument in predicting future substance use, emotional, and behavioral problems: 18-Month predictive validity of the substance use risk profile scale. *Alcoholism Clinical and Experimental Research, 37*(s1), E281-E290.
- Castellanos-Ryan, N., Rubia, K., & Conrod, P. J. (2011). Response inhibition and reward response bias mediate the predictive relationships between impulsivity and sensation seeking and common and unique variance in conduct disorder and substance misuse. *Alcoholism Clinical and Experimental Research, 35*, 140-155.
- Chaplin, E., Partsenidis, I., Samuriwo, B., Underwood, L., & McCarthy, J. (2014). Does substance use predict contact with the criminal justice system for people with intellectual disabilities. *Journal of Intellectual Disabilities and Offending Behaviour, 5*, 147-153.
- Cohen, J. A. (1960). Coefficient of agreement for nominal scales. *Education and Psychological Measurements, 20*, 37-46.
- Cohen, J. (1988). *Statistical Power Analysis for the Behavioral Sciences, 2nd edition*. Hillsdale, NJ: Laurence Erlbaum Associates.
- Comeau, N., Stewart, S. H., & Loba, P. (2001). The relations of trait anxiety, anxiety sensitivity, and sensation seeking to adolescents' motivations for alcohol, cigarettes and marijuana use. *Addictive Behaviors, 26*, 803-825.
- Connor, D., Carlsen, G., Chang, K., Daniolos, P., Findling, R., & Steiner, H. (2006). Juvenile maladaptive aggression: A review of preventions, treatment, and service configuration and a proposed research agenda. *Journal of Clinical Psychiatry, 67*(5), 808-820.
- Conrod, P. J. (2016). Personality-Targeted Interventions for Substance Use and Misuse. *Current addiction reports, 3*(4), 426-436. <https://doi.org/10.1007/s40429-016-0127-6>
- Conrod, P. J., Castellanos-Ryan, N., & Mackie, C. J. (2011). Long-term effects of a personality-targeted intervention to reduce alcohol use in adolescents. *Journal of Consulting and Clinical Psychology, 79*, 296-306.
- Conrod, P. J., Castellanos, N., & Strang, J. (2010). Brief, personality-targeted coping skills interventions prolong survival as a non-drug user over a two-year period during adolescence. *Archives of General Psychiatry, 67*, 85-93.
- Conrod, P. J., Comea N., & Maclean, A. M. (2006). Efficacy of cognitive-behavioral interventions targeting personality risk factors for youth alcohol misuse. *Journal of Clinical Child & Adolescent Psychology, 35*, 490-504.
- Conrod, P. J., & Nikolaou, K. (2016). Annual Research Review: On the developmental neuropsychology of substance use disorders. *Journal of Child Psychology and Psychiatry, and Allied Disciplines, 57*(3), 371-394. <https://doi.org/10.1111/jcpp.12516>

- Conrod, P. J., O'Leary-Barrett, M., Newton, N., Topper, L., Castellanos-Ryan, N., Mackie, C., & Girard, A. (2013). Effectiveness of a selective, personality-targeted prevention program for adolescent alcohol use and misuse: A cluster randomized controlled trial. *JAMA Psychiatry, 70*(3), 334-342.
- Conrod, P. J., Petersen, J. B., & Pihl, R. O. (1997). Disinhibited personality and sensitivity to alcohol reinforcement: independent correlates of drinking behavior in sons of alcoholics. *Alcoholism, Clinical and Experimental Research, 21*(7), 1320-1332.
- Conrod, P. J., Pihl, R. O., Stewart, S. H., & Dongier, M. (2000). Validation of a system of classifying female substance abusers on the basis of personality and motivational risk factors for substance abuse. *Psychology of Addictive Behaviors, 14*, 243-256.
- Conrod, P. J., Pihl, R. O., & Vassileva, J. (1998). Differential sensitivity to alcohol reinforcement in groups of men at risk for distinct alcoholism subtypes. *Alcoholism, Clinical and Experimental Research, 22*(3), 585-597. <https://doi.org/10.1111/j.1530-0277.1998.tb04297.x>
- Conrod P. J., & Woicik P. (2002). Validation of a four factor model of personality risk for substance abuse and examination of a brief instrument for assessing personality risk. *Addiction Biology, 7*, 329-346.
- Cooper, M. L. (1994). Motivations for Alcohol Use Among Adolescents: Development and validation of a four-factor model. *Psychological Assessment, 6*, 117-128.
- Cooper, M. L. (2015). *Motivational models of substance use: A review of Theory and Research on Motives for Using Alcohol, Marijuana and Tobacco*. Oxford Handbook online.
- Cooper, M. L., Frone, M. R., Russell, M., & Mudar, P. (1995). Drinking to regulate positive and negative emotions: a motivational model of alcohol use. *Journal of Personality and Social Psychology, 69*(5), 990-1005. <https://doi.org/10.1037//0022-3514.69.5.990>
- Cox, W. M., & Klinger, E. (1988). A motivational model of alcohol use. *Journal of Abnormal Psychology, 97*, 168-180.
- Davis, M. L., Powers, M. B., Handelsman, P., Medina, J. L., Zvolensky, M., & Smits, J. A. (2015). Behavioral therapies for treatment-seeking cannabis users: a meta-analysis of randomized controlled trials. *Evaluation & the Health Professions, 38*(1), 94-114. <https://doi.org/10.1177/0163278714529970>
- Deci, E. L., & Ryan, R. M. (2000). The 'what' and 'why' of goal pursuits: Human needs and the self-determination of behavior. *Psychological Inquiry, 11*, 319-338.
- Dermitzaki, I., Stavroussi, P., Bandi, M., & Nisiotou, I. (2008). Investigating ongoing strategic behaviour of students with mild mental retardation: Implementation and relations to performance in a problem-solving situation. *Evaluation & Research in Education, 21*, 96-110.
- DeSimone, J. (1998). Is Marijuana a Gateway Drug?. *Eastern Economic Journal, Eastern Economic Association, 24b*(2), 149-164.
- Didden, R. (2017). Substance use and abuse in individuals with mild intellectual disability or borderline intellectual functioning: An introduction to the special section. *Research in Developmental Disabilities, 63*, 95-98.
- Didden, R., Collin, Ph., & Curfs, L. (2008). *Psychopathologie bij mensen met een verstandelijke beperking*. In Handboek psychopathologie: Deel 1 Basisbegrippen (613-637). Houten: Bohn Stafleu van Loghum.
- Didden, R., Embregts, P., van der Toorn, M., & Laarhoven, N. (2009). Substance abuse, coping strategies, adaptive skills and behavioral and emotional problems in clients with mild to borderline intellectual disability admitted to a treatment facility: A pilot study. *Research in Developmental Disabilities, 30*(5), 927-932. <https://doi.org/10.1016/j.ridd.2009.01.002>

- Diden, R., Korzilius, H., Oorsouw van, W., & Sturmey, P. (2006). Behavioral treatment of challenging behaviors in individuals with mild mental retardation: Meta-analysis of single-subject research. *American Journal of Mental Retardation*, 111, 290-298.
- Diden, R., VanDerNagel, J., Delforterie, M., & van Duijvenbode, N. (2019). Substance use disorders in people with intellectual disability. *Current Opinion in Psychiatry*, 33(2), 124-129. <https://doi.org/10.1097/YCO.0000000000000569>
- Donaldson, A., Lloyd, D. G., Gabbe, B. J., Cook, J., & Finch, C. F. (2017). We have the programme, what next? Planning the implementation of an injury prevention programme. *Injury prevention : journal of the International Society for Child and Adolescent Injury Prevention*, 23(4), 273-280. <https://doi.org/10.1136/injuryprev-2015-041737>
- Douma, J., Dekker, M. C., Verhulst, F. C., & Koot, H. M. (2006). Self-reports on mental health problems of youth with moderate to borderline intellectual disabilities. *Journal of the American Academy of Child and Adolescent Psychiatry*, 45(10), 1224-1231. <https://doi.org/10.1097/01.chi.0000233158.21925.95>
- Duarte, R., Escario, J., & Molina, J. A. (2011). Peer effects, unobserved factors and risk behaviours in adolescence. *Revista de Economia Aplicada XIX (55)*, 125-151
- Durlak, J. A., & DuPre, E. P. (2008). Implementation matters: a review of research on the influence of implementation on program outcomes and the factors affecting implementation. *American journal of community psychology*, 41(3-4), 327-350. <https://doi.org/10.1007/s10464-008-9165-0>
- Duijvenbode, N. van, Didden, R., Korzilius, H. P., & Engels, R. C. M. E. (2016). The addicted brain: Cognitive biases in problematic drinkers with mild to borderline intellectual disability. *Journal of Intellectual Disability Research*, 60, 242-253.
- Duijvenbode, N. van, Didden, R., Korzilius, H. P., Trentelman, M., & Engels, R. C. M. E. (2013). Executive control in long-term abstinent alcoholics with mild to borderline intellectual disability: The relationship with IQ and severity of alcohol use-related problems. *Research in Developmental Disabilities*, 34, 3583-3595.
- Duijvenbode, N. van, & VanDerNagel, J. E. L. (2019). A Systematic Review of Substance Use (Disorder) in Individuals with Mild to Borderline Intellectual Disability. *European Addiction Research*, 25(6), 263-282. <https://doi.org/10.1159/000501679>
- Duijvenbode, N. van, VanDerNagel, J. E. L., Didden, R., Engels, R. C. M. E., Buitelaar, J. K., & Kiewik, M. (2015). Substance use disorders in individuals with mild to borderline intellectual disability: Current status and future directions. *Research in Developmental Disabilities*, 38, 319-328.
- Dupont, H. B., Lemmens, P., Adriana, G., VanDeMheen, D., & DeVries, N. K., (2015). Developing the Moti-4 intervention, assessing its feasibility and pilot testing its effectiveness. *BMC Public Health*, 15, 500.
- Dusenbury, L., Brannigan, R., Falco, M., & Hansen, W. B. (2003). A review of research on fidelity of implementation: implications for drug abuse prevention in school settings. *Health Education Research*, 18(2), 237-256. <https://doi.org/10.1093/her/18.2.237>
- Edalati, H., Afzali, M. H., Castellanos-Ryan, N., & Conrod, P. J. (2019). The Effect of Contextual Risk Factors on the Effectiveness of Brief Personality-Targeted Interventions for Adolescent Alcohol Use and Misuse: A Cluster-Randomized Trial. *Alcoholism, Clinical and Experimental Research*, 43(5), 997-1006. <https://doi.org/10.1111/acer.14016>
- Emerson, E., Einfeld, S., & Stancliffe, R. J. (2010). The mental health of young children with intellectual disabilities or borderline intellectual functioning. *Social Psychiatry and Psychiatric Epidemiology*, 45(5), 579-587. <https://doi.org/10.1007/s00127-009-0100-y>

- Ennett, S. T., Haws, S., Ringwalt, C. L., Vincus, A. A., Hanley, S., Bowling, J. M., & Rohrbach, L. A. (2011). Evidence-based practice in school substance use prevention: fidelity of implementation under real-world conditions. *Health Education Research, 26*(2), 361–371. <https://doi.org/10.1093/her/cyr013>
- Fergusson, D. M., Boden, J. M., & Horwood, L. J. (2006). Cannabis use and other illicit drug use: Testing the cannabis gateway hypothesis. *Addiction, 101*(4), 556–569. <https://doi.org/10.1111/j.1360-0443.2005.01322.x>
- Forbat, L. (1999). Developing an alcohol awareness course for clients with a learning disability. *British Journal of Learning Disabilities, 27*, 16–19.
- Frielink, N., & Embregts, P. (2013). Modification of motivational interviewing for use with people with mild intellectual disability and challenging behaviour. *Journal of Intellectual Developmental Disabilities, 38*, 279–91.
- Frielink, N., Schuengel, C., Kroon, A., & Embregts, P. J. (2015). Pretreatment for substance-abusing people with intellectual disabilities: intervening on autonomous motivation for treatment entry. *Journal of Intellectual Disability Research, 59*(12), 1168–1182. <https://doi.org/10.1111/jir.12221>
- Fujiura, G. T. (2003). Continuum of intellectual disability: Demographic evidence for the “forgotten generation”. *Mental Retardation, 41*(6), 420–429. [https://doi.org/10.1352/0047-6765\(2003\)41<420:COIDDE>2.0.CO;2](https://doi.org/10.1352/0047-6765(2003)41<420:COIDDE>2.0.CO;2)
- Grant, B., & Dawson, D. (1997). Age at onset of alcohol use and its association with DSM-IV alcohol abuse and dependence: results from the National Longitudinal Alcohol Epidemiologic Survey. *Journal of Substance Abuse, 9*, 103–10.
- Gigi, K., Werbeloff, N., Goldberg, S., Portuguese, S., Reichenberg, A., Fruchter, E., & Weiser, M. (2014). Borderline intellectual functioning is associated with poor social functioning, increased rates of psychiatric diagnosis and drug use—a cross sectional population based study. *European Neuropsychopharmacology, 24*(11), 1793–1797. <https://doi.org/10.1016/j.euroneuro.2014.07.016>
- Hassiotis, A., Strydom, A., Hall, I., Ali, A., Lawrence-Smith, G., & Meltzer, H. (2008). Psychiatric morbidity and social functioning among adults with borderline intelligence living in private households. *Journal of Intellectual Disabilities and Research, 52*, 95–106.
- 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. <https://doi.org/10.15288/jsa.1997.58.280>
- Hecimovic, K., Barrett, S. P., Darredeau, C., & Stewart, S. H. (2014). Cannabis use motives and personality risk factors. *Addictive Behaviors, 39*(3), 729–732. <https://doi.org/10.1016/j.addbeh.2013.11.025>
- Hogue, A., Bobek, M., Dauber, S., Henderson, C. E., McLeod, B. D., & Southam-Gerow, M. A. (2017). Distilling the Core Elements of Family Therapy for Adolescent Substance Use: Conceptual and Empirical Solutions. *Journal of Child & Adolescent Substance Abuse, 26*(6), 437–453. <https://doi.org/10.1080/1067828X.2017.1322020>
- Hogue, A., Dauber, S., Bobek, M., Jensen-Doss, A., & Henderson, C. E. (2019). Measurement Training and Feedback System for Implementation of family-based services for adolescent substance use: protocol for a cluster randomized trial of two implementation strategies. *Implementation Science, 14*(1), 25. <https://doi.org/10.1186/s13012-019-0874-6>

- Hu, L., & Bentler, P. (1999). Cutoff criteria for fit indices in covariance structure analysis: conventional criteria versus new alternatives. *Structural Equation Modeling, 6*, 1-55.
- Janssen, T., Larsen, H., Peeters, M., Pronk, T., Vollebergh, W. A., & Wiers, R. W. (2014). Interactions between parental alcohol-specific rules and risk personalities in the prediction of adolescent alcohol use. *Alcohol & Alcoholism, 49*, 579-585.
- Juberg, A., Røstad, M., & Søndena, E. (2017). Substance use problems among people with mild/ borderline intellectual disability: Challenges to mainstream multidisciplinary specialist substance treatment in Norway. *Nordisk Alkohol- & Narkotikatidskrift, 34(2)*, 173-185. <https://doi.org/10.1177/1455072516687255>
- Kahn, J., Ducharme, P., Travers, B., & Gonzalez-Heydrich, J. (2009). RAGE Control: Regulate and Gain Emotional Control. *Studies of Health Technological Information, 149*, 335-43.
- Kandel D. (1975). Stages in adolescent involvement in drug use. *Science (New York, N.Y.)*, *190(4217)*, 912-914. <https://doi.org/10.1126/science.1188374>
- Kaptein, S, Jansen, D., Vogels, A. G. C., & Reijneveld, S. A. (2008). Mental health problems in children with intellectual disability: Use of the Strengths and Difficulties Questionnaire. *Journal of Intellectual Disability Research, 52 (2)*, 125-31.
- Kazdin A. E. (2019). Single-case experimental designs. Evaluating interventions in research and clinical practice. *Behaviour research and therapy, 117*, 3-17. <https://doi.org/10.1016/j.brat.2018.11.015>
- Kendall, P. C., & Braswell, L. (1985). *Cognitive-Behavioral Therapy for Impulsive Children*. New York: Guilford.
- Kepper, A., VanDenEijnden, R., Monshouwer, K., & Vollebergh, W. (2014). Understanding the elevated risk of substance use by adolescents in special education and residential youth care: the role of individual, family and peer factors. *European Child & Adolescents Psychiatry, 23(6)*, 461-72.
- Kerr, S., Lawrence, M., Darbyshire, C., Middleton, A. R., & Fitzsimmons, L. (2013). Tobacco and alcohol-related interventions for people with mild/moderate intellectual disabilities: a systematic review of the literature. *Journal of Intellectual Disability Research, 5*, 393-408.
- Kiewik, M., VanDerNagel, J. E. L., Engels, R. C. M. E., & de Jong, C. A. J. (2017). Intellectually disabled and addicted: A call for evidence based tailor-made interventions. *Addiction, 112(11)*, 2067-2068.
- Kiewik, M., VanDerNagel, J. E. L., Kemna, L. E., Engels, R. C. M. E., & deJong, C. A. J. (2015). Substance use prevention program for adolescents with intellectual disabilities on special education schools: a cluster randomised control trial. *Journal of Intellectual Disabilities Research, 60(3)*, 191-200.
- Kleinert, H. L., Browder, M. D., & Towles-Reeves, E. A. (2009). Models of cognition for students with significant cognitive disabilities: Implications for assessment. *Review of Educational Research, 79*, 301-326.
- Kouimtsidis, C., Houghton, B., Gage, H., Notley, C., Maskrey, V., Clark, A., Holland, R., Lingford-Hughes, A., Pudukollu, B., & Duka, T. (2019). A feasibility study of an intervention for structured preparation before detoxification in alcohol dependence: The SPADe trial protocol. *Pilot and Feasibility Studies, 5*, 59. <https://doi.org/10.1186/s40814-019-0446-1>
- Krank, M., Stewart, S. H., O'Connor, R., Woicik, P. B., Wall, A. M., & Conrod, P. J. (2011). Structural, concurrent, and predictive validity of the Substance Use Risk Profile Scale in early adolescence. *Addictive Behaviors, 36*, 37-46.
- Kuntsche, E., & Cooper, M. L. (2010). Drinking to have fun and to get drunk: Motives as predictors of weekend drinking over and above usual drinking habits. *Drug & Alcohol Dependence, 110*, 259-262.

- Kuntsche, E., Knibbe, R., Engels, R. C. M. E., & Gmel, G. (2007). Bullying and fighting among adolescents -do drinking motives and alcohol use matter? *Addictive Behaviors*, *32*, 3131-3135.
- Kuntsche, E., Knibbe, R., Gmel, G., & Engels, R. C. M. E. (2005). Why do young people drink? A review of drinking motives. *Clinical Psychology Review*, *25*, 841-861.
- Kuntsche, E., & Kuntsche, S. (2009). Development and validation of the Drinking motive questionnaire revised Short Form (DMQ-R SF). *Journal of Clinical Child & Adolescent Psychology*, *38*, 899-908.
- Kuntsche, E., Le Mével, L., & Berson, I. (2016). Development of the four-dimensional Motives for Listening to Music Questionnaire (MLMQ) and associations with health and social issues among adolescents. *Psychology of Music*, *44*, 219-233.
- Lammers, J., Goossens, F., Conrod, P., Engels, R. C. M. E., Wiers, R. W., & Kleinjan, M. (2015). Effectiveness of a selective intervention program targeting personality risk factors for alcohol misuse among young adolescents: Results of a cluster randomized controlled trial. *Addiction*, *110*(7), 1101-1109.
- Lammers, J., Goossens, F., Lokman, S., Monshouwer, K., Lemmers, L., Conrod, P., Wiers, R., Engels, R., & Kleinjan, M. (2011). Evaluating a selective prevention programme for binge drinking among young adolescents: Study protocol of a randomized controlled trial. *BMC public health*, *11*, 126. <https://doi.org/10.1186/1471-2458-11-126>
- Lawrence M., Kerr S., Darbyshire C., Middleton A., & Fitzsimmons L. (2009). *Tobacco and Alcohol Use in People Who Have A Learning Disability: Giving Voice to Their Health Promotion Needs*. Glasgow Caledonian University, Glasgow.
- Lingam, R., & Scott, J. (2002). Treatment non-adherence in affective disorders. *Acta Psychiatrica Scandinavica*, *105*(3), 164-172. <https://doi.org/10.1034/j.1600-0447.2002.1r084.x>
- Loewenthal, K. M. (1996). *An introduction to psychological tests and scales*. London: UCL Press Limited.
- Lokman, S., Neijmeijer, L., & Bransen, E.(2012). *Toolkit LVB en verslaving*. Trimbos-instituut, Utrecht.
- Mahu, I. T., Doucet, C., O'Leary-Barrett, M., & Conrod, P. J. (2015). Can cannabis use be prevented by targeting personality risk in schools? Twenty-four-month outcome of the adventure trial on cannabis use: a cluster-randomized controlled trial. *Addiction*, *110*(10), 1625-1633.
- Mackinnon, S. P., Kehayes, I. L., Clark, R., Sherry, S. B., & Stewart, S. H. (2014). Testing the four-factor model of personality vulnerability to alcohol misuse: A three-wave, one-year longitudinal study. *Psychology of Addictive Behaviors*, *28*, 1000-1012.
- Malmberg, M., Overbeek, G., Monshouwer, K., Lammers, J., Vollebergh, W. A. M., & Engels, R. C. M. E. (2010). Substance use risk profiles and associations with early substance use in adolescence. *Journal of Behavioural Medicine*, *33*, 474-485.
- McGillicuddy, N.B. (2006). A review of substance use research among those with mental retardation. *Mental Retardation and Developmental Disabilities Research Reviews*, *12*(1), 41-7.
- McGillicuddy, N. B., & Blane, H. T. (1999). Substance use in individuals with mental retardation. *Addictive behaviors*, *24*(6), 869-878. [https://doi.org/10.1016/s0306-4603\(99\)00055-6](https://doi.org/10.1016/s0306-4603(99)00055-6)
- McGillivray, J. A., & Moore, M. R. (2001). Substance use by offenders with mild intellectual disability. *Journal of Intellectual and Development Disabilities*, *26*, 297-310.
- McHugh, R. K., Hearon, B. A., & Otto, M. W. (2010). Cognitive behavioral therapy for substance use disorders. *The Psychiatric Clinics of North America*, *33*(3), 511-525. <https://doi.org/10.1016/j.psc.2010.04.012>
- Mendel, E., & Hipkins, J. (2002). Motivating learning disabled offenders with alcohol-related problems: A pilot study. *British Journal of Learning Disabilities*, *30*(4), 153-158. <https://doi.org/10.1046/j.1468-3156.2002.00209.x>

- Mezquita, L., Stewart, S.H., & Ruipérez, A. (2010). Big-five personality domains predict internal drinking motives in young adults. *Personality and Individual Differences, 49*, 240-245.
- Miller, W. R. (1983). Motivational interviewing with problem drinkers. *Behavioural Psychotherapy, 11*, 147-172.
- Moher, D., Schulz, K. F., Altman, D. G., & CONSORT Group (2003). The CONSORT statement: revised recommendations for improving the quality of reports of parallel-group randomised trials. *Clinical Oral Investigations, 7*(1), 2-7. <https://doi.org/10.1007/s00784-002-0188-x>
- Muthén, L. K., & Muthén, B. O. (1998-2012). *Mplus user's guide (7th ed.)*. Los Angeles: Author.
- Newton, N. C., Teesson, M., Mather, M., Champion, K. E., Barrett, E. L., Stapinski, L., Carragher, N., Kelly, E., Conrod, P. J., & Slade, T. (2018). Universal cannabis outcomes from the Climate and Preventure (CAP) study: A cluster randomised controlled trial. *Substance Abuse Treatment, Prevention, and Policy, 13*(1), 34. <https://doi.org/10.1186/s13011-018-0171-4>
- Nakagawa, S. & Schielzeth, H. (2013). A general and simple method for obtaining R2 from generalized linear mixed-effects models. *Methods Ecological Evolution, 4*, 133-142.
- Nouwens, P., Lucas, R., Smulders, N., Embregts, P., & van Nieuwenhuizen, C. (2017). Identifying classes of persons with mild intellectual disability or borderline intellectual functioning: A latent class analysis. *BMC Psychiatry, 17*(1), 257. <https://doi.org/10.1186/s12888-017-1426-8>
- Oeseburg, B., Jansen, D. E., Groothoff, J. W., Dijkstra, G. J., & Reijneveld, S. A. (2010). Emotional and behavioural problems in adolescents with intellectual disability with and without chronic diseases. *Journal of Intellectual Disability Research, 54*(1), 81-89. <https://doi.org/10.1111/j.1365-2788.2009.01231.x>
- Orobio de Castro, B., Embregts, P., Nieuwenhuijzen, M. van, & Stolker, J. J. (2008). Samen op zoek naar effectieve behandeling van gedragsproblemen bij cliënten met een lichte verstandelijke beperking. *Onderzoek & Praktijk, 6*(1), 6-12.
- Pacula, R. L. (1998). Does increasing the beer tax reduce marijuana consumption?. *Journal of Health Economics, 17*(5), 557-585. [https://doi.org/10.1016/s0167-6296\(97\)00039-8](https://doi.org/10.1016/s0167-6296(97)00039-8)
- Pauly, B., Martin, W., Perkin, K. van Roode, T., Kwan, A., Patterson, T., Tong, S., Prescott, C., Wallace, B., Hancock, & MacDonald, M. (2018). Critical considerations for the practical utility of health equity tools: a concept mapping study. *International for Journal Equity in Health, 17*-48. <https://doi.org/10.1186/s12939-018-0764-6>
- Peltopuro, M., Ahonen, T., Kaartinen, J., Seppälä, H., & Närhi, V. (2014). Borderline intellectual functioning: a systematic literature review. *Intellectual and Developmental Disabilities, 52* (6), 419-443.
- Pieterse, M. E., VanDerNagel, J. E. L., Ten Klooster, P. M., Turhan, A., & Didden, R. (2020). Psychometric Qualities of the Dutch Version of the Substance Use Risk Profile Scale Adapted for Individuals with Mild Intellectual Disabilities and Borderline Intellectual Functioning. *Journal of Mental Health Research in Intellectual Disabilities, 13* (3), 250-266.
- Pihl, R. O., & Peterson, J. (1995). Drugs and aggression: correlations, crime and human manipulative studies and some proposed mechanisms. *Journal of Psychiatry & Neuroscience, 20*(2), 141-149.
- Poelen, E. A., Schijven, E. P., Otten, R., & Didden, R. (2017). Personality dimensions and substance use in individuals with mild to borderline intellectual disabilities. *Research in developmental disabilities, 63*, 142-150. <https://doi.org/10.1016/j.ridd.2016.10.003>
- Poelen, E. A. P., Schijven, E.P., & Vermaes, I. (2015). De prevalentie van middelengebruik bij jongeren met een licht verstandelijke beperking en ernstige gedragsproblemen in een orthopedagogisch behandelcentrum [Prevalence of substance use among adolescents with mild intellectual disability or borderline intellectual functioning and severe behavioral problems who receive residential care]. *Onderzoek & Praktijk, 13*, 25-37.

- Pulkkinen, L., & Pitkänen, T. (1994). A prospective study of the precursors to problem drinking in young adulthood. *Journal of Studies on Alcohol*, 55(5), 578–587. <https://doi.org/10.15288/jsa.1994.55.578>
- R Core Team R: *A Language and Environment for Statistical Computing*. Vienna: R Foundation for Statistical Computing; 2017.
- Reynolds, S., Wilson, C., Austin, J., & Hooper, L. (2012). Effects of psychotherapy for anxiety in children and adolescents: a meta-analytic review. *Clinical Psychology Review*, 32(4), 251–262. <https://doi.org/10.1016/j.cpr.2012.01.005>
- Riper, H., Andersson, G., Hunter, S. B., de Wit, J., Berking, M., & Cuijpers, P. (2014). Treatment of comorbid alcohol use disorders and depression with cognitive-behavioural therapy and motivational interviewing: A meta-analysis. *Addiction*, 109(3), 394–406.
- Rutledge, P. C., & Sher, K. J. (2001). Heavy drinking from the freshman year into early young adulthood: the roles of stress, tension-reduction drinking motives, gender and personality. *Journal of Studies on Alcohol*, 62(4), 457–466. <https://doi.org/10.15288/jsa.2001.62.457>
- Sakdalan, J. A., Kittner, D. M., & Judd, D. (2017). ASAP-ID: substance abuse programme for a forensic ID population. *Journal of Intellectual Disabilities and Offending Behaviour*, 8 (4), 157–165.
- Schijven, E. P., Engels, R. C. M. E., Kleinjan, M., & Poelen, E. A. P. (2015). Evaluating a selective prevention program for substance use and comorbid behavioral problems in adolescents with mild to borderline intellectual disabilities: Study protocol of a randomized controlled trial. *BMC Psychiatry*, 15, 167.
- Schijven, E. P., VanDerNagel, J. E. L., Lammers, J., & Poelen, E. A. P. (2014). *Trainershandleiding Take it personal!: Een interventie voor middelengebruik en comorbide gedragsproblemen voor jongeren met een licht verstandelijke beperking*. [Manual for trainers Take it personal!: An intervention for adolescents with mild intellectual disabilities and borderline intellectual functioning, substance use and comorbid behavioral problems]. Nijmegen, Pluryn.
- Schijven, E. P., VanDerNagel, J., Otten, R., Lammers, J., & Poelen, E. A. P. (2021). Take it personal! Development and modelling study of an indicated prevention programme for substance use in adolescents and young adults with mild intellectual disabilities and borderline intellectual functioning. *Journal of Applied Research in Intellectual Disabilities*, 34(1), 307–315. <https://doi.org/10.1111/jar.12808>
- Schall, M., Kemeny, A., & Maltzman, I. (1992). Factors associated with alcohol use in university students. *Journal of Studies on Alcohol*, 53(2), 122–136. <https://doi.org/10.15288/jsa.1992.53.122>
- Seligman, L. D., & Ollendick, T. H. (2011). Cognitive-behavioral therapy for anxiety disorders in youth. *Child and Adolescent Psychiatric Clinics of North America*, 20(2), 217–238. <https://doi.org/10.1016/j.chc.2011.01.003>
- Sher, K. J., Bartholow, B. D., & Wood, M. D. (2000). Personality and substance use disorders: a prospective study. *Journal of Consulting and Clinical Psychology*, 68(5), 818–829.
- Simpson M. (2012). Alcohol and intellectual disability: personal problem or cultural exclusion?. *Journal of Intellectual Disabilities*, 16(3), 183–192. <https://doi.org/10.1177/1744629512455595>
- Smedslund, G., Berg, R. C., Hammerstrøm, K. T., Steiro, A., Leiknes, K. A., Dahl, H. M., & Karlsen, K. (2011). Motivational interviewing for substance abuse. *The Cochrane Database of Systematic Reviews*, (5), CD008063. <https://doi.org/10.1002/14651858.CD008063.pub2>
- Snell, M. E., Luckasson, R., Borthwick-Duffy, W. S., Bradley, V., Buntinx, W. H., Coulter, D. L., Craig, E. P., Gomez, S. C., Lachapelle, Y., Reeve, A., Schalock, R. L., Shogren, K. A., Spreat, S., Tassé, M. J., Thompson, J. R., Verdugo, M. A., Wehmeyer, M. L., & Yeager, M. H. (2009). Characteristics and needs of people with intellectual disability who have higher IQs. *Intellectual and Developmental Disabilities*, 47(3), 220–233. <https://doi.org/10.1352/1934-9556-47.3.220>

- Spoont, M. R. (1992). Modulatory role of serotonin in neural information processing: implications for human psychopathology. *Psychological Bulletin*, 112(2), 330–350. <https://doi.org/10.1037/0033-2909.112.2.330>
- Spriggens, L., & Hides, L. (2015). Patterns of cannabis use: Psychotic-like experiences and personality styles in young cannabis users. *Schizophrenia Research*, 165, 3–8.
- Steiger, J. H. (1990). Structural model evaluation and modification: An interval estimation approach. *Multivariate Behavioural Research*, 25, 173–180.
- Steenhuis, I. H. M., & Poel, van der E. (2009). Alcohol- en drugsgebruik bij licht verstandelijk gehandicapte jongeren in de leeftijd van 15–25 jaar. *Maandblad Geestelijke Volksgezondheid*, 64, 66–78.
- Stewart, S. H., & Devine, H. (2000). Relations between personality and drinking motives in young students. *Personality Individual Differences*, 29, 495–511.
- Stewart, S. H., Loughlin, H. L., & Rhyno, E. (2001). An examination of the mediating roles of internal drinking motives in explaining personality domain-drinking behaviour relations in young adults. *Personality and Individual Differences*, 30, 271–286.
- Stewart, S. H., Peterson, J. B., & Pihl, R. O. (1995). Anxiety sensitivity and self-reported alcohol consumption rates in university women. *Journal of Anxiety Disorders*, 9(4), 283–292. [https://doi.org/10.1016/0887-6185\(95\)00009-D](https://doi.org/10.1016/0887-6185(95)00009-D)
- Stewart, S. H., Zvolensky, M. J., & Eifert, G. H. (2001a). Negative-reinforcement drinking motives mediate the relation between anxiety sensitivity and increased drinking behaviour. *Personality Individual Differences*.
- Taggart, L., McLaughlin, D., Quinn, B., & Milligan, V. (2006). An exploration of substance misuse in people with intellectual disabilities. *Journal of Intellectual Disability Research*, 50, 588–597.
- To, W. T., Neirwynck, S., Vanderplasschen, W., VanHeule, S., & VanDerVelde, S. (2014). Substance use and misuse in persons with intellectual disabilities (ID): results of a survey in ID and addiction services in Flanders. *Research Developmental Disabilities*, 35, 1–9.
- Turhan, A., Onrust, S. A., Ten Klooster, P. M., & Pieterse, M. E. (2017). A school-based programme for tobacco and alcohol prevention in special education: effectiveness of the modified 'healthy school and drugs' intervention and moderation by school subtype. *Addiction*, 112(3), 533–543. <https://doi.org/10.1111/add.13672>
- United Nations. (2012). *World drug report 2012*. New York United States: United Nations.
- VanderMolen, M. J., Van Luit, J. E., Jongmans, M. J., & Van der Molen, M. W. (2007). Verbal working memory in children with mild intellectual disabilities. *Journal of Intellectual Disability Research*, 51(Pt 2), 162–169. <https://doi.org/10.1111/j.1365-2788.2006.00863.x>
- VanDerNagel, J. E. L., Kiewik, M., Dijk, M. van, Jong, C. de, & Didden, R. (2011). *Handleiding SumID-Q. Meetinstrument voor het in kaart brengen van middelengebruik bij mensen met een lichte verstandelijke beperking* [SumID-Q Manual Instrument to assess substance use in individuals with mild intellectual disability]. Deventer: Tactus Verslavingszorg.
- VanDerNagel, J. E. L., Kiewik, M., Buitelaar, J. K., & De Jong, C. A. (2011). Staff Perspectives of Substance Use and Misuse Among Adults With Intellectual Disabilities Enrolled in Dutch Disability Services. *Journal of Policy and Practice in Intellectual Disabilities*. 8(3), 143–149.
- VanDerNagel, J. E. L., Kiewik, M., Dijk, M. van, Didden, R., Korzilius, H. P. L. M., Palen, J. van der, Buitelaar, J. K., Uges, D. R. A., Koster, R. A., & Jong, C. A. J. de (2017). Substance use in individuals with mild to borderline intellectual disability: A comparison between self-report, collateral-report and biomarker analysis. *Research in Developmental Disabilities*, 63, 151–159.

- VanDerNagel, J. E., Kiewik, M., Postel, M. G., van Dijk, M., Didden, R., Buitelaar, J. K., & de Jong, C. A. (2014). Capture recapture estimation of the prevalence of mild intellectual disability and substance use disorder. *Research in Developmental Disabilities, 35*(4), 808–813. <https://doi.org/10.1016/j.ridd.2014.01.018>
- Vereenoooghe, L., & Langdon, P. E. (2013). Psychological therapies for people with intellectual disabilities: a systematic review and meta-analysis. *Research in Developmental Disabilities, 34*(11), 4085–4102. <https://doi.org/10.1016/j.ridd.2013.08.030>
- Verhulst, F. C., Ende, Van der, J. & Koot, H. M. (1997). *Manual for the Youth Self-Report (YSR)* [in Dutch]. Rotterdam: Erasmus University/Department of Child and Adolescent Psychiatry, Sophia Children's Hospital.
- Vries, de H., Dijkstra, M. & Kuhlman, P. (1988). Self-efficacy: the third factor besides attitude and Subjective norm as a predictor of behavioural intentions. *Health Education Research, 3*, 273–282.
- Webb, C. A., Auerbach, R. P., & Derubeis, R. J. (2012). Processes of change in CBT of adolescent depression: Review and recommendations. *Journal of Clinical Child & Adolescent Psychology, 41*(5), 654–665. <https://doi.org/10.1080/15374416.2012.704842>
- Wit, M. de, Moonen, X., & Douma, J. (2011). *Richtlijn effectieve interventies LVB: Aanbevelingen voor het ontwikkelen, aanpassen en uitvoeren van gedragsveranderende interventies voor jeugdigen met een licht verstandelijke beperking* [Guideline for effective interventions MID: Recommendations to develop, adapt and implement behavioral modification interventions for adolescents with mild intellectual disability]. Utrecht: Landelijk Kenniscentrum LVG.
- Woicik, P. A., Stewart, S. H., Pihl, R. O., & Conrod, P. J. (2009). The substance use risk profile scale: a scale measuring traits linked to reinforcement-specific substance use profiles. *Addictive Behaviors, 34*, 1042–1055.
- World Health Organization. (2014). *Global status report on alcohol 2014*. Geneva Switzerland: World Health Organization.
- Zwaluw, C. S. van der, Kuntsche, E., & Engels, R. C. M. E. (2011). Risky alcohol use in adolescence: the role of genetics (DRD2, SLC6A4) and coping motives. *Alcoholism, Clinical & Experimental Research, 35*(4), 756–64.

APPENDECIS

Nederlandse samenvatting
(Dutch summary)

Curriculum vitae

Publications

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9

Dutch summary (nederlandse samenvatting)

Dit proefschrift richt zich op de ontwikkeling van een interventie voor jongeren en jongvolwassenen met een licht verstandelijke beperking (LVB) of zwakbegaafdheid met middelengebruik. Patronen van middelengebruik bij mensen met een LVB of zwakbegaafdheid zijn vergelijkbaar met mensen zonder een verstandelijke beperking, maar zij hebben wel een groter risico op het ontwikkelen van een middelen gerelateerde stoornis (Van Duijvenbode & VanderNagel, 2019; Didden, VanDerNagel, Delforterie, Van Duijvenbode, 2020; Van Duijvenbode et al., 2015; VanDerNagel, Kiewik, Buitelaar, & de Jong, 2011). Daarnaast zijn de consequenties van het gebruik vaak groter in deze doelgroep dan in de gemiddelde populatie. Consequenties van het gebruik liggen op verschillende domeinen, zoals relatieproblemen, conflicten, financiële problemen, huisvestingsproblemen en psychische problemen zoals risico op psychoses, depressies of angststoornissen (Chapman & Wu, 2012; Cocco & Harper, 2002; McGillicuddy, 2006; To, Neiryneck, Vanderplasschen, Vanheule, & Vandeveldde, 2014; Van Duijvenbode & VanDerNagel, 2019). Risicofactoren voor het ontwikkelen van middelengebruik en misbruik bij mensen met een LVB zijn nog onvoldoende onderzocht. Wel is bekend dat mensen met comorbide psychiatrische stoornissen, mensen met een forensische achtergrond en mensen met ernstige gedragsproblemen een groter risico lopen op het ontwikkelen van problematisch middelengebruik. Motieven voor gebruik zijn onderzocht in de normaal begaafde doelgroep en er zijn vier verschillende motieven voor gebruik beschreven in het Motivatie Model van Cox en Klinger (1988). Ook persoonlijkheidsdimensies zijn belangrijk voor een beter begrip van middelengebruik onder normaal begaafde jongeren. In de theorie van Conrod, Comeau en Maclean (2006) worden vier verschillende persoonlijkheidsprofielen geformuleerd die een verhoogd risico op problematisch gebruik laten zien, namelijk; sensatie zoekend gedrag, impulsiviteit, angst gevoeligheid en negatief denken. Elk persoonlijkheidsprofiel wordt geïndiceerd met specifieke patronen voor middelenmisbruik, maladaptieve motieven voor gebruik en specifieke vormen van comorbide psychopathologie. Zo drinken sensatie zoekers veel, hebben de neiging om te drinken om euforische (bedwelmende) effecten te ervaren en lopen risico op nadelige consequenties van het gebruik. Impulsieve jongeren beginnen vaak met gebruik van alcohol en drugs op jonge leeftijd. Angst gevoelige jongeren worden vooral geassocieerd met hoog gebruik van alcohol, zijn gevoelig voor het angst-dempende effect van alcohol en gebruiken vooral om te kunnen omgaan met negatieve gevoelens. Jongeren met het persoonlijkheidsprofiel negatief denken hebben vaak motieven voor gebruik overeenkomend met motieven passend bij depressieve

mensen. Deze vier persoonlijkheidsprofielen worden ook bij jongeren met een LVB gezien als een risicofactor voor problematisch middelengebruik.

Er is een grote behoefte aan het ontwikkelen of aanpassen van interventies gericht op het voorkomen van middelengebruik en misbruik bij deze doelgroep, omdat reguliere interventieprogramma's onvoldoende aansluiten op de cognitieve capaciteiten van jongeren met een LVB (Carroll Chapman & Wu, 2012; Didden, VanDerNagel, Delforterie, & van Duijvenbode, 2019; Kerr, Lawrence, Darbyshire, Middleton, & Fitzsimmons, 2013; van Duijvenbode et al., 2015; van Duijvenbode & VanDerNagel, 2019). In de laatste decennia is interesse in onderzoek gericht op deze doelgroep gegroeid. Er zijn acht eerdere studies gepubliceerd die onderzoek beschrijven naar interventieprogramma's gericht op educatie, preventie, pre-behandeling en behandeling voor mensen met een LVB en middelengebruik (Forbat, 1999; Kiewik, VanDerNagel, Kemna, Engels, & DeJong, 2015; Kiewik, VanDerNagel, Engels, & DeJong, 2017; McGillicuddy & Blane, 1999; Turhan, Onrust, Klooster, & Pieterse, 2017; Mendel & Hipkins, 2002; Frielink, Schuengel, Kroon, & Embregts, 2015; Kouimtsidis et al., 2019; Sakdalan, Kittner, & Judd, 2017). Op basis hiervan kan echter geconcludeerd worden dat er nog steeds een schaarste is aan interventieprogramma's die speciaal ontwikkeld zijn voor, of aangepast zijn aan de behoeftes van deze populatie. Daarnaast is er ook weinig onderzoek gedaan naar interventies die er wél zijn. De studies die er zijn laten zien dat deelnemers wel meer kennis hebben opgedaan of dat de motivatie om te stoppen met gebruik is toegenomen na een bepaalde interventie, maar dat het gebruik zelf niet is afgenomen.

Interventieprogramma's gebaseerd op de eerder genoemde vier persoonlijkheidsprofielen (sensatie zoeken, impulsiviteit, angstgevoeligheid en negatief denken) zijn effectief voor de normaal begaafde populatie in het verminderen van gebruik. Mogelijk biedt deze benadering ook een antwoord op de specifieke en ingewikkelde behoeftes van mensen met een LVB en problematisch middelengebruik. Dit proefschrift richt zich op de ontwikkeling van Take it personal! en onderzoek naar de effectiviteit van de interventie. Take it personal! is een geïndiceerd preventieprogramma voor jongeren en jongvolwassenen met een LVB en middelengebruik en is gebaseerd op deze vier persoonlijkheidsprofielen. Deel 1 van deze thesis bestaat uit onderzoek naar de specifieke kenmerken van deze populatie die input kunnen geven aan de ontwikkeling van een interventie gericht op middelengebruik bij jongeren met een LVB. Deel 2 van deze thesis beschrijft de ontwikkeling van de interventie en onderzoek naar de effectiviteit ervan.

Bevindingen

In **Hoofdstuk 2** werd de rol van de vier persoonlijkheidsdimensies (sensatie zoeken, impulsiviteit, angst gevoeligheid en negatief denken) onderzocht in het middelengebruik van mensen met een LVB. Persoonlijkheidsprofielen werden in kaart gebracht met de aangepaste versie van de Substance Use Risk Profile Scale; (SURPS). Er deden 118 mensen met een LVB mee aan het onderzoek met een gemiddelde leeftijd van 20,5 jaar en een gemiddeld intelligentie quotiënt van 71.1. Zij waren allen opgenomen in een behandelcentrum voor mensen met een LVB en ernstige gedragsproblemen. We vonden geen significant verband tussen het niveau van verstandelijke beperking (LVB of zwakbegaafdheid) en de vier persoonlijkheidsdimensies, wat aangeeft dat de persoonlijkheidsdimensies niet anders waren tussen personen met een LVB dan die met zwakbegaafdheid. Bovendien toonden de bevindingen aan dat personen die hoog scoorden op negatief denken, impulsiviteit en sensatie zoeken, ernstiger alcoholgebruik vertoonden. Personen met hoge scores op negatief denken en sensatie zoeken vertoonden een ernstiger niveau van drugsgebruik. De resultaten van dit onderzoek komen over het algemeen overeen met de bestaande literatuur over persoonlijkheidsdimensies bij personen met een gemiddelde intelligentie, wat aangeeft dat deze persoonlijkheidsdimensies voorspellend zijn bij personen met een hoger risico op het ontwikkelen van problematisch middelengebruik. De resultaten van dit onderzoek benadrukken het belang om deze persoonlijkheidsdimensies mee te nemen in het aanpassen van interventies voor deze doelgroep en deze interventies te ontwikkelen met een meer persoonlijkheidsgerichte aanpak.

In **Hoofdstuk 3** werd de relatie onderzocht tussen de verschillende motieven voor gebruik zoals beschreven in het Motivational Model voor alcoholgebruik door Cox en Klinger (1988) en middelengebruik bij mensen met een LVB. Volgens dit model wordt de keuze om wel of niet te gaan drinken bepaald door zowel rationele als emotionele processen. Het model gaat ervan uit dat jongeren alcohol gebruiken om ofwel positieve uitkomsten te vergroten (zoals sociale acceptatie of 'erbij' horen) dan wel negatieve gevolgen te vermijden (bijvoorbeeld het verminderen van negatieve gevoelens) (Kuntsche, Knibbe, Gmel, & Engels, 2005; Kuntsche & Kuntsche, 2009). In dit model worden vier motieven onderscheiden voor het gebruik van alcohol. Mensen die gebruiken vanuit 'sociale motieven' drinken op sociale gelegenheden om sociale relaties aan te gaan en te genieten van deze gelegenheden. Mensen die drinken vanuit het 'confirmity motief' gebruiken alcohol om sociale afwijzing te voorkomen en 'erbij' te horen. Mensen met het 'coping motief' gebruiken alcohol om te kunnen omgaan met negatieve emoties en

problemen. Als laatste drinken mensen met het 'enhancement motief' om in een positieve stemming te komen en plezier te hebben of dronken te worden. Aan dit onderzoek hebben 163 cliënten met een LVB deelgenomen. We ontdekten dat alcoholgebruik een positieve relatie heeft met sociale motieven voor middelengebruik; dit komt overeen met eerdere bevindingen onder personen zonder verstandelijke beperking waarin werd gevonden dat sociale motieven verband houden met niet-problematische alcoholgebruik (Cooper, 1994; Mezquita, Stewart & Ruipérez, 2010). Evenzo is licht alcoholgebruik sociaal geaccepteerd en gaat het hand in hand met gezonde sociale relaties. Daarnaast ontdekten we dat coping-, enhancement- en conformity motieven positief gerelateerd waren aan de ernst van alcoholgebruik. Geconcludeerd kan worden dat zowel coping- als enhancement-motieven een risico vormen voor problematisch alcoholgebruik bij mensen met MID-BIF. In overeenstemming met bevindingen met betrekking tot de frequentie van alcoholgebruik, toonde deze studie aan dat sociale motieven positief gerelateerd zijn aan de frequentie van cannabis- en hard drugsgebruik bij mensen met een LVB. Voor problematisch drugsgebruik waren coping-motieven het meest dominant. Deze inzichten hebben implicaties voor zowel het beleid in de klinische praktijk als voor interventies voor preventie en behandeling van middelengebruik. De resultaten van deze studie benadrukken het belang van het opnemen van motieven in gepersonaliseerde interventies voor mensen met een LVB en middelengebruik in plaats van een 'one-size-fits-all'-benadering te gebruiken. Bovendien laten onze resultaten zien dat veel mensen met een LVB in residentiële zorg een verhoogd risico lopen op problematisch middelengebruik.

In **Hoofdstuk 4** werd het studieprotocol van de gerandomiseerde en gecontroleerde studie naar de effectiviteit van de geïndiceerde preventieve interventie Take it personal! beschreven. Hierin werden de achtergrond, hypothesen, design, doelgroep, procedure, interventie Take it personal!, uitkomstmaten en analysemethoden toegelicht. Jongeren die benaderd worden voor deze studie zijn jongeren met een LVB en ernstige gedragsproblemen, alle jongeren die deelnemen ontvangen intramurale of extramurale zorg van een behandelsetting in Nederland. Inclusie criteria voor deelname zijn eerder experimenteel middelengebruik en een van de vier persoonlijkheidsprofielen voor gebruik. Jongeren worden random toegewezen aan de controle groep (N=70) of de interventiegroep (N=70). De interventiegroep krijgt zes weken lang de interventie Take it personal! aangeboden door twee gekwalificeerde trainers, bestaande uit zes individuele sessies en 5 groepssessies. Primaire uitkomstmaten waren de vermindering van het middelengebruik (voor alcohol: drankmisbruik, frequentie van gebruik en problematisch

gebruik; voor cannabis: frequentie van gebruik; voor andere harddrugs: frequentie van gebruik; en voor alle drugsgebruik: problematisch gebruik). Alle uitkomstmaten werden beoordeeld na twee, zes en twaalf maanden na de interventie. Secondaire uitkomstmaten zijn de motieven voor gebruik, de intentie om te gaan gebruiken en internaliserende en externaliserende gedragsproblemen.

In **Hoofdstuk 5** werd de theorie en ontwikkeling van Take it personal! uiteengezet. Daarnaast is er een kleine pilotstudie uitgevoerd om de gebruikersvriendelijkheid, de uitvoerbaarheid en de potentiële effectiviteit in kaart te brengen. De ontwikkeling van Take it personal! vond plaats aan de hand van het Interventie Mapping protocol (Bartholomew, Parcel, Kok, & Gottlieb, 2001). Dit protocol start met een uiteenzetting waar behoefte aan is in het veld, gevolgd door vijf stappen: (1) bepaling van het doel van de interventie, (2) selectie van de methoden en strategieën voor de interventie, (3) ontwikkeling van de interventie en het uitvoeren van een kleine pilot studie, (4) het uitvoeren van de interventie en het goed implementeren van de interventie en als laatste (5) het evalueren van de interventie. Intervention Mapping is een helpende methodiek om systematisch en stapsgewijs een interventie te ontwikkelen die zowel theoretisch als evidence-based goed onderbouwd is. Take it personal! is een geïndiceerd preventieprogramma dat beoogt middelengebruik bij jongeren en jongvolwassenen met een LVB in de leeftijd van 14-30 jaar oud te verminderen. De interventie is gebaseerd op de vier persoonlijkheidsprofielen zoals eerder beschreven (sensatie zoeken, impulsiviteit, angst gevoeligheid en negatief denken). Mensen die hoog scoren op sensatie zoeken zijn vaker mensen die veel drinken en hebben een verhoogd risico op negatieve gevolgen vanwege hun gebruik. Impulsieve mensen missen het vermogen om hun gedragsimpulsen uit te stellen wanneer zij geconfronteerd worden met een positieve bekrachtiger. Angst gevoelige personen laten verhoogde niveaus van alcoholgebruik zien, zijn vaker gevoelig voor het angst-remmende effect van alcohol, drinken vaker om te kunnen omgaan met negatieve emoties en hebben een verhoogd risico op problematisch gebruik. Mensen met het profiel negatief denken gebruiken vaak verschillende middelen om om te gaan met negatieve gedachten. Take it personal! heeft voor elk persoonlijkheidsprofiel een aparte interventie ontwikkeld die bestaat uit vijf groepssessies en vijf individuele sessies verspreid over 6 weken. De interventie is gebaseerd op de cognitieve gedragstherapie, motiverende gespreksvoering en speciaal voor de doelgroep LVB zitten er in de groepssessies oefeningen uit de psychomotorische therapie verwerkt. De interventie start met (1) psycho-educatie; waarbij de deelnemers meer inzicht krijgen in hun persoonlijkheidsprofiel en bijbehorende risico's, daarna (2) richt de interventie zich op copingstrategieën op gedrag en als laatste

op (3) cognitieve copingstrategieën. Jongeren gaan in de training gedrag leren herkennen en proberen te beïnvloeden waardoor zij minder risicovolgedrag gaan laten zien zoals middelengebruik.

Een kleine pilotstudie is uitgevoerd gericht op het onderzoeken van de gebruikersvriendelijkheid, uitvoerbaarheid en potentiële effectiviteit. Aan deze studie deden zes jongeren mee. Hieruit kwam naar voren dat Take it personal! goed uitvoerbaar en aantrekkelijk in gebruik is. Op de meting ná de interventie werd gevonden dat de frequentie van gebruik, binge drinken en problematisch gebruik waren afgenomen in vergelijking met de meting voor de interventie. Hieruit werd geconcludeerd dat Take it personal! op zijn minst veelbelovend kan zijn in het terugdringen van middelengebruik bij jongeren en jongvolwassenen met een LVB.

In **Hoofdstuk 6** werden de resultaten gepresenteerd van een quasi-experimentele studie naar de effecten van Take it personal!. De opzet van de studie was oorspronkelijk een RCT studie. Echter, de opzet werd gewijzigd in een quasi-experimentele studie met twee armen, omdat individuele of clusterrandomisatie niet mogelijk bleek voor de klinische setting waarin die plaats moest vinden. 66 deelnemers met een LVB werden bij aanvang gescreend en vervolgens toegewezen aan ofwel de interventieconditie (Take it personal! en gebruikelijke zorg (N=34)) ofwel de controleconditie (gebruikelijke zorg (N=32)); follow-up metingen werden afgenomen na 3 maanden. We hebben niet de oorspronkelijk geplande steekproefomvang bereikt, ondanks onze inspanningen tijdens de wervingsfase, zie ook de beperkingen van dit proefschrift in **hoofdstuk 6** en in de algemene discussie. Take it personal! is gebaseerd op de vier persoonlijkheidsprofielen die samenhangen met risicovol middelengebruik, namelijk: sensatie zoeken, impulsiviteit, angstgevoeligheid en negatief denken. Voor elk van deze profielen is een aparte interventie ontwikkeld die wat betreft opbouw en structuur hetzelfde waren, maar verschillende persoonlijkheid specifieke materialen, spelletjes en oefeningen bevatten. In Take it personal! leren jongeren omgaan met hun persoonlijkheidsprofiel waardoor risicovol gedrag, zoals middelengebruik, kan afnemen. Interventie-effecten werden gevonden voor de frequentie van middelengebruik en binge-drinken, maar niet voor problematisch middelengebruik. Wanneer er gekeken wordt naar specifieke middelen is er een nuance te zien op deze laatste maat, aangezien de interventie effectief was voor de ernst van alcoholgebruik, maar niet voor problematisch cannabis of harddrugs gebruik. Door het aanbieden van een effectief preventieprogramma voor middelengebruik bij jongeren en jongvolwassenen lijkt Take it personal! een belangrijke bijdrage te kunnen leveren aan het terugdringen van middelengebruik bij deze doelgroep, een doelgroep

waar tot nu toe zo weinig voor beschikbaar was. Take it personal! gaat niet uit van een uniforme behandeling maar gaat in op specifieke behoeftes van deze doelgroep door een gepersonaliseerde aanpak te hanteren. Deze aanpak lijkt beter aan te sluiten dan bestaande programma's en lijkt jongeren met een LVB beter te helpen hun gebruik onder controle te krijgen vóórdat het escaleert in ernstig problematisch gebruik of een stoornis.

Conclusie

De bevindingen in dit proefschrift dragen bij aan de kennis over risicovolle factoren bij mensen met een LVB en middelengebruik. Daarnaast heeft dit onderzoek een effectief geïndiceerd preventieprogramma opgeleverd voor jongeren en jongvolwassenen met een LVB, middelengebruik en gedragsproblemen. Persoonlijkhedenconstructen dragen bij aan het begrijpen van middelengebruik onder normaal begaafde jongeren -maar zoals wij lieten zien- ook bij jongeren met een LVB. Vier persoonlijkheidsprofielen (sensatie zoeken, impulsiviteit, angst gevoeligheid en negatief denken) zijn geassocieerd met problematisch gebruik en kennen elk specifieke patronen en motieven voor gebruik. Deze inzichten hebben wij gebruikt voor het ontwikkelen van het geïndiceerde preventieve programma Take it personal!; een interventie gericht op het terugdringen van problematisch middelengebruik onder jongeren en jongvolwassenen met een LVB en gedragsproblemen. Uit ons onderzoek komt naar voren dat Take it personal! 1) uitvoerbaar is in een behandelsetting voor intramurale of extramurale zorg aan deze doelgroep, dat 2) de interventie aantrekkelijk is voor de deelnemers en 3) dat de training effectief blijkt in het verminderen van de frequentie van het middelengebruik, een afname in binge drinken en een afname in problematisch alcoholgebruik.

Onze bevindingen bieden suggesties voor de klinische praktijk en vervolgonderzoek. Ten eerste vonden wij hoge prevalentiecijfers met betrekking tot de ernst en mate van middelengebruik. Deze cijfers zijn ronduit zorgelijk en verder onderzoek naar de motieven naar dit gebruik wordt geadviseerd om deze doelgroep beter in kaart te krijgen en eerder op te kunnen screenen en identificeren. Ook werd in ons onderzoek veel cannabisgebruik gevonden. In het licht van het 'gateway-effect' (DeSimone, 1998; Pacula, 1998; Beenstock & Rahav, 2002; Fergusson, Boden, & Horwood, 2006), waarbij wordt aangenomen dat gebruik van mildere middelen makkelijk overgaat in harddrugs gebruik, is dit een zorgelijke ontwikkeling. Hulpverleners uit de klinische praktijk moeten zich bewust zijn van dit effect, zodat er al op jonge leeftijd ingezet kan worden op voorkomen en vermindering van tabak en cannabisgebruik.

Het is voor het eerst dat de vier persoonlijkheidsprofielen werden onderzocht bij mensen met een LVB of zwakbegaafdheid. Deze theorie is alleen onderzocht onder normaal begaafde mensen. Een recente studie van Pieterse en collega's (2020) heeft deze constructen ook onderzocht bij mensen met een LVB en zij hebben vergelijkbare resultaten gevonden als in onze studie. Dit versterkt de onderbouwing om de persoonlijkheidsprofielen te gebruiken in de ontwikkeling van interventies voor middelengebruik bij mensen met een LVB, maar meer onderzoek is nodig. Door de complexiteit van de klinische doelgroep is het in onze studie niet gelukt het geplande aantal deelnemers te includeren. De laatste jaren is er steeds meer aandacht voor alternatieve ontwerpen die mogelijk meer geschikt zijn om interventies in een klinische setting te onderzoeken. 'Single case-experimentele' studies bijvoorbeeld laten verschillende voordelen zien ten opzichte van een RCT design, waaronder dat jongeren niet in een controle conditie kunnen belanden waardoor zij sneller gemotiveerd zullen zijn voor deelname, een belangrijke reden waarom jongeren in onze studie niet gemotiveerd waren voor deelname. Met behulp van een dergelijk onderzoeksdesign zou de effectiviteit van Take it personal! verder onderzocht kunnen worden. Daarnaast is het raadzaam om de mogelijke lange termijn effecten in kaart te brengen, om te onderzoeken of effecten niet alleen op korte termijn zichtbaar zijn maar jongeren ook helpt om op langere termijn te minderen met hun gebruik. Om de effectiviteit van Take it personal! nog verder te vergroten, denken wij dat het goed is om ouders/verzorgers meer te betrekken bij de training. Mensen met een LVB hebben moeite om het geleerde te generaliseren naar andere situaties, hun directe omgeving zou hierbij kunnen ondersteunen (De Wit, Moonen & Douma, 2011; Orobio de Castro et al., 2008). Tot slot is een goede implementatie van Take it personal! van belang, waarbij trainers gecertificeerd zijn, om jongeren zo optimaal mogelijk te laten profiteren van de interventie.

De resultaten van dit proefschrift geven inzicht in de risicofactoren voor middelengebruik bij adolescenten met een LVB. Kennis over persoonlijkheidsprofielen en bijbehorende motieven achter het ontstaan van problematisch middelengebruik en stoornissen in gebruik is essentieel voor effectieve geïndiceerde preventie. De op persoonlijkheidsprofielen gebaseerde benadering lijkt te passen bij de complexe behoeften van deze risicovolle populatie van jongeren en jongvolwassenen met een LVB, en biedt een antwoord op de behoefte aan een passend behandelaanbod. De aanpak van Take it personal! vermindert de frequentie van middelengebruik bij jongeren en jongvolwassenen met een LVB om zo een middelen gerelateerde stoornis te voorkomen.

Curriculum vitae

Esmee Schijven was born on July 27th 1985 in Nijmegen, the Netherlands. After completing her secondary education at The Etty Hillesum college in Deventer in 2004, she studied Clinical Developmental Psychology at the University of Amsterdam (2004-2010). During her studies she volunteered at an international school for orphan girls in Calcutta, India. After that she travelled through Thailand, Malaysia and Indonesia. For a clinical internship during her Master Clinical Developmental Psychology, she worked at the Beele, Pluryn. A residential institution for youngsters with mild intellectual disabilities or borderline intellectual functioning and severe behavioral problems. After completing her internship and graduation of her master degree, she kept on working at the Beele as a psychologist. In 2013 she started to combine her work at the Beele with an external PhD at the Pluryn Research & Development department in collaboration with the Radboud University in Nijmegen. After working seven years at the Beele she decided she wanted to work closer to home and started working at De Koppeling, Spirit, a secure institution for youth with sincere psychological and behavioral problems. After one year, she switched to Lijn5, a residential youth care institution for adolescents with mild intellectual disabilities or borderline intellectual functioning and sincere behavioral problems. While working at Lijn5 she completed her training as a cognitive behavioral therapist, EMDR therapist and in 2021 her post-master degree as a healthcare psychologist (GZ-psycholoog) at the RINO Amsterdam.

Publications

- Hulsmans, D., Otten, R., Schijven, E. P., & Poelen, E. A. P. (2021). Exploring the role of emotional and behavioral problems in a personality-targeted prevention program for substance use in adolescents and young adults with intellectual disability. *Research in Developmental Disabilities, 109*, 103832. <https://doi.org/10.1016/j.ridd.2020.103832>
- Poelen, E. A. P., Schijven, E. P., & Otten, R. (2022). The mediating role of substance use motives in the relationship between personality dimensions and alcohol and drug use in adolescents and young adults with mild intellectual disabilities. *Addictive Behaviors, 126*, 107173. <https://doi.org/10.1016/j.addbeh.2021.107173>
- Poelen, E. A. P., Schijven, E. P., Otten, R., & Didden, R. (2017). Personality dimensions and substance use in individuals with mild to borderline intellectual disabilities. *Research in Developmental Disabilities, 63*, 142–150. <https://doi.org/10.1016/j.ridd.2016.10.003>
- Poelen, E. A. P., Schijven, E.P., & Vermaes, I. (2015). De prevalentie van middelengebruik bij jongeren met een licht verstandelijke beperking en ernstige gedragsproblemen in een orthopedagogisch behandelcentrum [Prevalence of substance use among adolescents with mild intellectual disability or borderline intellectual functioning and severe behavioral problems who receive residential care]. *Onderzoek & Praktijk, 13*, 25-37.
- Schijven, E. P., Didden, R., Otten, R., & Poelen, E. A. P. (2019). Substance use among individuals with mild intellectual disability or borderline intellectual functioning in residential care: Examining the relationship between drinking motives and substance use. *Journal of Applied Research in Intellectual Disabilities: JARID, 32*(4), 871–878. <https://doi.org/10.1111/jar.12578>
- Schijven, E. P., Engels, R. C. M. E., Kleinjan, M., & Poelen, E. A. P. (2015). Evaluating a selective prevention program for substance use and comorbid behavioral problems in adolescents with mild to borderline intellectual disabilities: Study protocol of a randomized controlled trial. *BMC Psychiatry, 15*, 167.
- Schijven, E.P., Hulsmans, D.H.G., Bex, N.; Nagel, J.E.L. van der, Lammers, J., Otten, R. Poelen, E.A.P. (2020). De effectiviteit van take it personal! Een programma voor geïndiceerde preventie van middelengebruik bij jongeren met een licht

verstandelijke beperking en gedragsproblemen [The effectiveness of Take it personal! A program for indicated prevention of substance use for adolescents with mild intellectual disabilities or borderline intellectual functioning and behavioral]. *Onderzoek & Praktijk*, 18, 33 – 42.

Schijven, E. P., Hulsmans, D., VanDerNagel, J., Lammers, J., Otten, R., & Poelen, E. A. P. (2021). The effectiveness of an indicated prevention programme for substance use in individuals with mild intellectual disabilities and borderline intellectual functioning: results of a quasi-experimental study. *Addiction*, 116(2), 373–381. <https://doi.org/10.1111/add.15156>

Schijven, E. P., VanDerNagel, J. E. L., Lammers, J., & Poelen, E. A. P. (2014). *Trainershandleiding Take it personal!: Een interventie voor middelengebruik en comorbide gedragsproblemen voor jongeren met een licht verstandelijke beperking*. [Manual for trainers Take it personal!: An intervention for adolescents with mild intellectual disabilities and borderline intellectual functioning, substance use and comorbid behavioral problems]. Nijmegen, Pluryn.

Schijven, E. P., VanDerNagel, J., Otten, R., Lammers, J., & Poelen, E. A. P. (2021). Take it personal! Development and modelling study of an indicated prevention programme for substance use in adolescents and young adults with mild intellectual disabilities and borderline intellectual functioning. *Journal of Applied Research in Intellectual Disabilities*, 34(1), 307–315. <https://doi.org/10.1111/jar.12808>

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