



Smoking cessation with teenagers: The relationship between impulsivity, emotional problems, program retention and effectiveness

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ABSTRACT

Aims: This study examines whether individual differences in impulsivity and emotional problems in adolescent smokers are related to initial smoking characteristics of participants, acceptance, retention and outcome of a school-based smoking cessation program.

Design: The data was obtained from a feasibility study of a youth-specific, cognitive-behavioral and motivation enhancing program at 22 schools with 139 participating teenage smokers in Germany. A one-group-pre-posttest design was realized.

Measurement: Impulsivity levels were assessed by use of the impulsivity scale of the IVE ("Inventar zur Erfassung von Impulsivität, Risikoverhalten und Empathie", Stadler, Janke, & Schmeck, 2004). To evaluate the extent of emotional problems, the corresponding 5-items scale of the SDQ-Deu ("Strength and difficulties questionnaire", Klasen et al., 2000) was applied. Smoking behavior and acceptance of the program were assessed by students' self-reports.

Findings: Acceptance and retention did not differ with regard to impulsivity and emotional problems, but initial smoking status did. Cessation rates varied with level of impulsivity: compared to non-impulsive participants, impulsive adolescents succeeded in quitting smoking less often. Emotional problems were not related to the rate of quitting.

Conclusions: Impulsive adolescents were similarly compliant to the offered cessation intervention as less impulsive smokers. In spite of their general positive evaluation, impulsive adolescents seem to benefit less from a smoking cessation program than their non-impulsive counterparts. Specific elements supporting impulsive teenage smokers in their goal to quit should be incorporated into youth-specific cessation programs.

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1. Introduction

Parallel to the introduction of many tobacco control policies, during the last 10 years the percentage of adolescent smokers has decreased by about 50% in Germany (Bundeszentrale für gesundheitliche Aufklärung BZgA, 2011). Even so, one in four 16 to 17 year olds reports smoking occasionally or regularly (BZgA, 2011). Thus subgroups of adolescents seem to be insusceptible to preventive policy changes. Given the significance of personality traits in the development of addictive behaviors (National Research Council and Institute of Medicine, 2009), adolescents whose personality is characterized by impulsivity and emotional instability might belong to this insusceptible subgroup. The majority of young smokers (about

60%) want to quit cigarette use and 12 to 15 year old adolescents are more willing to stop than smokers in the age group of 16 to 19 year olds (BZgA, 2006). In spite of their belief that quitting smoking is simple (O'Loughlin, Gervais, Dugas, & Meshefedjian, 2009), young people often fail to quit, and only about 8% succeed (Bancej, O'Loughlin, Platt, Paradis, & Gervais, 2007). Thus, there is a need for effective cessation aids for adolescents not only from a public health perspective. Effective interventions can support the target group itself in their striving for a smoke-free life.

"[...] there is not yet sufficient evidence to recommend widespread implementation of any one [adolescent smoking cessation] model" (Grimshaw & Stanton, 2006, p.10). However, in their 2010 update of the Cochrane Review, the authors perceive promise in approaches that incorporate elements which stem from the stages of change and motivational enhancement model as well as from cognitive-behavioral therapy (Grimshaw & Stanton, 2006). Sussman and Sun (2009) conducted a meta-analysis of adolescent smoking cessation (ASC) studies published in English between 1970 and 2007 targeting the age group of 12 to 19 year olds. They analyzed

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data regarding content of the most effective smoking cessation programs, modality of delivery, number of contacts, and quit rate. The authors conclude that teen smoking cessation programs are efficacious overall. The average treatment quit rate was significantly raised compared to the control group condition (11.8% treatment group vs. 7.5% control group). These effects were maintained at all follow-ups. Cognitive-behavioral, motivation-enhanced and social influence programs were found to be most effective. In addition implementation in a school-based context was most successful. Programs with fewer than five sessions failed to find a program effect (Sussman & Sun, 2009). The US-smoking cessation program “Project Ex” incorporates these success-related characteristics. Evaluated with a sample of 335 students it resulted in a cessation rate of 17% in the intervention group compared to 8% in the control group (intention-to-treat-analysis, 30-day abstinence five months after quit day; Sussman, Dent, & Lichtman, 2001). There is only scarce research concerning predictors of treatment success (Branstetter, Horn, Dino, & Zhang, 2009). Motivation turned out to be a mediating factor of cessation effects of “Project Ex” (McCuller, Sussman, Wapner, Dent, & Weiss, 2006). Self-initiated quitting is predicted by lower initial smoking, fewer friends who smoke, accepting social controls against smoking, and few family members who smoke (Sussman, 2002).

Apart from effectiveness, recruitment and retention is a major problem in ASC (Backinger et al., 2008; Sussman & Sun, 2009; ACCESS Consortium, 2010). Generally, participants of cessation programs seem to be fairly heavy smokers, smoking approximately 10 cigarettes per day (Sussman, 2002; Turner, Mermelstein, Berbaum, & Veldhuis, 2004). In an effort to disentangle facilitating factors of recruitment, Backinger et al. analyzed 55 ASC effectiveness studies (Backinger et al., 2008). Due to incomplete description only a few aspects could be examined, i.e. type of recruitment, use of incentives, intervention site, sample size, number of cigarettes smoked per day and length of follow-up. Results show that studies including lighter smokers had a significantly higher recruitment rate than those with a target group that included a higher percentage of stronger smokers. Yet, studies with stronger smokers were more likely to have high retention rates (Backinger et al., 2008). Turner et al. (2004) revealed that early attendance in a school-based group program was predicted by higher motivation to quit and less perceived stress at baseline. In addition, they found that participants with higher nicotine dependence and more positive smoking expectancies were more likely to attend the first sessions (Turner et al., 2004). To our knowledge, recruitment and retention have not been studied with regard to personality factors.

1.1. Impulsivity and smoking behavior

Impulsivity, known as a risk factor for addiction (Perry & Carroll, 2008; De Wit, 2009), contains several clinically relevant components including a diminished ability to inhibit inappropriate behaviors, a tendency to act without forethought and a relative insensitivity to behavioral consequences (Moeller, Barratt, Dougherty, Schmitz, & Swann, 2001; Evenden, 1999). Several studies illustrate that impulsivity is linked to youth smoking behavior (Krishnan-Sarin et al., 2007; Reynolds, Karraker, Horn, & Richards, 2003; Waldeck & Miller, 1997), although the relationship is not as consistent as reported in the adult literature (Granö, Virtanen, Vahtera, Elovainio, & Kivimäki, 2004; Mitchell, 1999). Based on behavioral tasks, Reynolds et al. (2003) found that adolescents who had recently tried cigarettes for the first time (“triers”), showed a more impulsive behavior concerning the discounting of monetary rewards not only than never smokers, but also than “established” smokers. Waldeck and Miller (1997) concluded from their data that there is a relation between higher impulsivity level and a greater number of daily smoked cigarettes for female, but not for male students. According to a prospective study with an average observation period of 15 months, impulsivity did not predict smoking initiation in a sample of 59

adolescents aged between 12 and 14 years (Leff et al., 2003). With regard to cessation, externalizing behaviors including impulsivity, delinquency and aggression were predictive of a shorter abstinence period among program participants (Moolchan, Frazier, Franken, & Ernst, 2007). Krishnan-Sarin et al. (2007) showed that behavioral measures of impulsivity, but not self-reports, were related to smoking cessation treatment outcomes, with impulsive adolescents achieving smoking abstinence less often.

The nature of the relationship between smoking cessation and impulsivity is yet unclear. Several constructs have been examined among college students that abstained from smoking for a short time period. Heightened trait-impulsivity predicted a greater increase in craving and anxiety during a 48-hour-abstinence indicating a more distressing experience of quitting (VanderVeen, Cohen, Cukrowicz, & Trotter, 2008). Among the same sample, highly impulsive smokers had increased positive but not negative reinforcement expectancies toward tobacco use following 48 hour abstinence (VanderVeen et al., 2008). Thus more impulsive abstinent smokers might have stronger beliefs about positive effects of smoking which in turn might lead to less motivation to quit and poorer cessation outcomes (Doran, McChargue, & Cohen, 2007).

1.2. Internalizing behavior and smoking

Internalizing behaviors such as anxiety and depression are also correlated with tobacco use and smoking cessation in adolescence (Horn et al., 2004; Pedersen & von Soest, 2009; Patton et al., 1996; Vogel, Hurford, Smith, & Cole, 2003). Based on data of 2525 adolescents, it was shown by Patton et al. (1996) that smokers were twice as likely to have higher levels of psychiatric symptoms (anxiety and depression) than non-smokers. Higher depression levels are related to current smoking behavior and the intention to smoke in the future (Vogel et al., 2003). More specifically, in this study with 98 adolescents aged between 16 and 19 years instrumental helplessness and social introversion rather than low energy or sad mood were predictive of cigarette use and initiation. Horn et al. (2004) examined the relationship between depression, anxiety and adolescent smoking cessation, though the results were inconclusive. More depressive smokers succeeded in changing their smoking behavior more often during a comprehensive, cognitive-behavioral and life-skills based intervention than less depressive participants. The contrary was true for a brief intervention approach: here the less depressive adolescent smokers were more successful in stopping or reducing their tobacco use. A low level of anxiety predicted a higher change rate in the brief intervention condition but a lower rate in the comprehensive treatment group (Horn et al., 2004). Motivation to quit has been found to be higher among more depressive female adult smokers but self-efficacy, a similar concept to confidence in quitting, was shown to be less pronounced (Haukkala, Uutela, Vartiainen, McAlister, & Knekt, 2000). Thus, adolescent smokers with emotional problems might stop smoking during ASC programs if the program leads to elevated confidence in quitting.

Summing up, existing research points to a significance of personality factors such as impulsivity, anxiety and depression in adult tobacco use and smoking cessation. It is assumed that motivation to quit and confidence in quitting are mediators of this association. In contrast, results regarding impulsivity and smoking behavior in adolescence are inconsistent or not yet systematically examined. Although evidence supports the relation between smoking and internalizing behavior, the role of emotional problems in cessation has not yet been clarified. Finally, more research is needed to determine facilitating factors of recruitment and retention in order to enhance impact of ASC. In consequence we were interested in the moderating effect of impulsivity and emotional problems in reach and effectiveness of ASC in order to increase insight into processes that have the potential to increase its' impact.

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