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Mapping risk factors for substance use: Introducing the YouthMap12

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HIGHLIGHTS

- An "easy-to-implement" method to identify different risk groups was developed
- 1 low, 2 moderate and 3 high risk latent classes were identified in a national survey
- Externalizing problems were linked to cannabis, alcohol and cigarette use
- Internalizing problems were linked to use of OTC and prescription medicine
- The method was repeated in a municipality survey and findings were replicated

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ABSTRACT

Background: In adolescence, psychological problems and regular use of alcohol, cigarettes, cannabis and other drugs (AOD) tend to cluster together, strongly indicating that certain groups of young people are at elevated risk of developing a problematic use of AOD.
Objective: The aim of the present study was to develop an easy-to-implement screening instrument to identify subgroups of young people with different psychological problems at risk of problem use of AOD.
Method: 3589 randomly selected young Danes between 15 and 25 years of age, from a national survey ($n = 2702$) and a municipality survey ($n = 887$), answered a 12-item questionnaire (YouthMap12) with 6 items identifying externalizing problems (EP6) and 6 items identifying internalizing problems (IP6). Latent class analysis (LCA) was used to characterize groups at risk, and associations were estimated between EP6 and IP6 and regular use of AOD, and between latent class membership and regular use of AOD.
Results: LCA identified 6 classes with varying degrees of externalizing and internalizing problems: 70% of youth were in the low problem score class, and the remaining 30% were at various levels of risk. Regular use of cigarettes, cannabis and alcohol was strongly associated with classes characterized by externalizing problems, while over-the-counter and prescription medicine was strongly associated with classes characterized by internalizing problems.
Conclusions: Youth at risk of problem use of AOD can be identified using a simple and easily administered instrument.

1. Introduction

Risk-taking behaviors such as use of alcohol, cigarettes, cannabis and other drugs (AOD), risky sexual behavior and driving-related risks emerge in adolescence and tend to cluster together. This strongly indicates that certain groups of young people are at elevated risk of developing not only one, but several risk-taking behaviors (Wiefferink et al., 2006).

Despite the fact that risk behaviors cluster, prevention is very often focused on category-by-category approaches, in which each individual health-related behavior is addressed independently. As Wiefferink et al. point out, such a category-by-category approach creates a risk that extra-curricular activities become overloaded (Wiefferink et al., 2006). In addition, prevention programs rarely address specific risk groups, but usually target the general population (e.g. all pupils in secondary school). Within the health promotion sector there are thus increasing calls for an integrative approach to health-related behaviors. However, such a meaningful integrative approach will only be possible if there is some clustering, not only of the more direct risk-taking behaviors (e.g. drinking alcohol and smoking cigarettes), but also of the psychological and behavioral characteristics associated with or predictive of specific risk-taking behavior such as regular use of AOD.

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Latent class analysis (LCA) has been used to identify different classes of alcohol and drug use patterns and psychosocial risk groups in clinical as well as general populations. LCA approaches can be divided into four types: The first approach, which is used in the majority of studies, is that of AOD classification, in which classes of AOD patterns are first identified, and subsequently linked to different demographic, psychosocial and behavioral characteristics (e.g. Morley et al., 2015). Another approach is the mixed classification approach, which includes both the use of AOD and psychosocial factors associated with AOD use in the same LCA (e.g. Jackson et al., 2014). A third approach is the psychosocial classification approach, in which individuals are classified according to psychosocial characteristics and classes are subsequently characterized according to the use of AOD (e.g. Salas-Wright et al., 2014). Finally, a number of studies have used a longitudinal approach, in which respondents have been followed over time. These longitudinal studies can be based on AOD use as well as psychosocial classification approaches (e.g. Reboussin et al., 2015, Virtanen et al., 2015).

Studies that classify individuals based on AOD variables are helpful in clustering various types of AOD together, and may provide clues as to the pattern of substances being used by various groups in society. Classifying individuals based on their use of particular substances in a longitudinal design may inform researchers about substances that are typically used as entry drugs within a region or country and about transitions between types of drugs used. Studies using psychosocial variables, such as the present study, can be helpful in identifying subgroups at risk of initiating or escalating substance use, and in quantifying the number of individuals in a country or region who belong to a particular high-risk group.

Across methodologies, LCA studies converge in showing that high risk consumption of AOD is associated with both externalizing and internalizing problems, and that the strongest associations are with externalizing problems.

Associations between internalizing and externalizing problems and AOD use have also been reported in numerous studies using other methodologies. Some of the more robust findings have been associations between heavy use of alcohol and conduct problems, sensation seeking, poor well-being, and to some extent, internalizing problems (Fergusson, Horwood, and Ridder, 2005; Patrick and Schulenberg, 2013; Pedersen and von Soest, 2015). Tobacco smoking has been associated with both externalizing and internalizing problems (Ellickson, Tucker, and Klein, 2001; Fischer, Najman, Williams, and Clavarino, 2012; Griffin, Botvin, Scheier, Doyle, and Williams, 2003; Hayatbakhsh, Mamun, Williams, O'Callaghan, and Najman, 2013). Cannabis use has been linked with externalizing problems, such as attention deficit hyperactivity disorder (ADHD) and conduct disorder (Heron et al., 2013; Lee, Humphreys, Flory, Liu, and Glass, 2011), and with more general mental health and social problems (Fergusson and Boden, 2008; Griffith-Lendering, Huijbregts, Mooijaart, Vollebergh, and Swaab, 2011; Miettunen et al., 2014; Monshouwer et al., 2006; Volkow, Baler, Compton, and Weiss, 2014).

Although numerous studies have found support for a two-factor (internalizing and externalizing) model, some studies have stressed the co-occurrence between externalizing and internalizing problems (Cosgrove et al., 2011). Hence, in order to translate the associations between externalizing/internalizing problems and AOD use into policy, there is a need for strategies for classifying at-risk youth that are easy to understand and implement without reducing the psychosocial problems to a simple distinction between externalizing and internalizing problems.

The aim of the present cross-sectional study was to develop such an "easy-to-implement" method to identify different psychological subgroups of young people at high risk of developing problematic use of different types of drugs, including alcohol, cigarettes, cannabis, medicine for physical problems (over-the-counter (OTC) and prescription) and psychotropic medicine. The identification of subgroups at high risk is crucial in terms of directing prevention efforts at the most relevant groups and guiding integrative treatment approaches.

2. Material and methods

2.1. Sample

Data were drawn from two separate Danish surveys conducted in the spring of 2015 and carried out by Centre for Alcohol and Drug Research, Aarhus University. In the first survey (the National YouthMap Survey), a sample of 4853 persons between the 15–25 years of age, representing 806,577 young Danes, was randomly drawn from the central person registration numbers (CPR) by Statistics Denmark (the central authority on Danish statistics, see http://www.dst.dk/en). Potential respondents were invited by postal letter to complete a web-based questionnaire. Telephone interviews were conducted with those individuals who had not responded after two reminders. The final sample consisted of 2702 respondents representing a response rate of 56%. The respondents were 50.9% women (mean age 19.7) and 49.1% men (mean age 19.5).

In the second survey (the Gentofte YouthMap Survey), the same procedure was applied. A sample of 1530 persons between 15 and 25 years of age, representing 9432 persons, was randomly drawn from the CPR by Statistics Denmark. The final sample consisted of 887 respondents (58% response rate). The respondents were 50.4% women (mean age 18.6) and 49.6% men (mean age 18.8). Gentofte is the wealthiest municipality in Denmark. The mean total family income in 2014 was 115,093 EUR for a family in Gentofte versus 64,474 EUR for an average Danish family. In the present article, the Gentofte survey is used only to evaluate the reliability of the latent class model identified in the National YouthMap Survey. The demographic characteristics of the two surveys can be found in Table 1.

The Gentofte respondents were younger than the national respondents because most young people leave Gentofte after they have completed their upper secondary education. This relocation can explain why a lower percentage of youth from Gentofte were enrolled in further educational activities compared to youth in the national survey. In the national survey, 245 (9.06%) of the respondents were either immigrants (123/4.55%) or descendants with non-Danish citizenship (122/4.51%; a descendant being defined as a person whose parents were both born outside of Denmark). The 245 immigrants/descendants represented a response rate of 35.9%.

Table 1
Demographic characteristics of the two samples.

		Denmark n = 2702	Gentofte n = 887
		Percent	Percent
Sex	Women	50.93	49.61
	Men	49.07	50.39
Age	15–16 years	21.54	28.75
	17–19 years	29.64	36.08
	20–25 years	48.81	35.19
Educational activities	Lower secondary	21.21	24.58
	Upper secondary	24.91	39.23
	Vocational	9.85	3.39
	Further[a]	9.33	5.53
	Further (long)[b]	11.58	8.91
	Other	3.14	3.95
	None, employed	13.88	11.05
	None, not employed	6.11	3.38
Ethnicity	Immigrants	4.55	4.17
	Descendants	4.51	2.48
Living with	Parents	63.59	82.03
	Partner	4.50	2.82
	Alone, friends etc.	31.91	15.14

[a] Bachelor's degree (e.g. nurse and school teacher).
[b] Master's degree.