

Article

# Coaches' Health Promotion Activity and Substance Use in Youth Sports

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Academic Editor: Kristine Crondahl

Received: 14 January 2017; Accepted: 1 April 2017; Published: 7 April 2017

**Abstract:** There is an increasing amount of evidence suggesting youth sports clubs are an important setting for health promotion. Adolescents in sport club settings can benefit from exposures of positive and negative consequences to health. To better understand the sport club context and coaches' health promotion activity in substance use prevention, this study compares sport club members with non-members aged between 14–16 years old on their experience and use of alcohol, smoking and snuff and coaches' health promotion activity on substances. Methods: Adolescents ( $n = 671$ ) from sports clubs and from matched schools ( $n = 1442$ ) were recruited in this study. Multiple binary logistic regressions were performed on substance use. Results: Higher prevalence of substance use was associated with discussions of substances, often held by coaches. Significantly fewer girls who are sport club members had experiences in alcohol, smoking or snuff than their non-member counter-parts, the differences among boys varied by substance. Fewer sport club members experienced smoking than non-members. More boys used snuff than girls. Conclusions: The most salient points for health promotion were that girls who were sport club members used fewer substances and for boys the picture was more complicated. Coaches could be using reactive strategies through informal learning to address substance use in clubs, although more effective training on substance use for coaches is needed.

**Keywords:** sport club participation; coach; health promotion; youth; snuff; alcohol; smoking

## 1. Introduction

Sports clubs have increasingly been acknowledged as important settings for health promotion [1]. The term sports club is synonymous with organized sport and both are considered to consist of environments that support the healthy behaviours of its athletic members [2]. For example, sports club members have a good nutritional intake [3] and more meet physical activity recommendations than their non-members peers [4]. In addition to improved physical health, other non-sport specific psychosocial objectives, such as promoting social development, belonging and friendship, can be met through sports club participation [5]. Yet, as adolescents mature, sports clubs can be a context that exposes them to maladaptive behaviours, including substance use [6]. Substances that are legally available for adults, such as alcohol, tobacco and other nicotine products can be infiltrated into adolescence subculture [7]. The use of substances is appealing during adolescence as it may help define maturity and passage into adulthood [8]. It has been well documented that substances are problematic when they are addictive or lead to intoxication [9] and the effects from substances weaken sports performance [10]. Hence, the social pressures that are formed from sports clubs can be both good and bad—good being a social norm against unhealthy behaviors, and bad peer pressure for experimentation or use of substances, as examples.

The sports club setting is a popular leisure activity for children's participation outside of school hours. In Finland, half (51%) of young adolescents aged between 11 and 15 years old reported to actively take part in sport clubs [11]. However, the rate of sports club membership reduced from 58% in 11 years olds to 35% in 15 year olds [12]. The organizational structure in sports clubs can be divided into three levels—macro, meso and micro. Macro level denotes overall policies and orientation of the club activities, meso—means the club management activities, in this case the health promotion activity of a club, and micro—relates to the activities of the coaches [2]. Previous studies have dissected sports clubs and substance use prevention. In Sweden, it was found that many football clubs were successful in implementing alcohol policies and the key was well planned interventions [13]. In Australia, it was found that sports clubs' poor alcohol management practices were associated with increased likelihood of alcohol consumption [14].

Sports clubs in Finland are largely run by volunteers, and organized training sessions conducted by volunteer coaches. However, 98% of club coaches have a minimal qualification to coach [15], hence much of the learning in sports clubs is considered as informal [16]. The necessity for qualifications of coaches in clubs supports the notion that coaches play important roles in the clubs. At the same time, the majority of the sport coaches for youth have reported substances as being the least acted health topics [17]. Coaches are typically uninterested to cover topics on substances in coach training [13,18]. Sports club administrators can be influential at the level of health promotion within the club [2] although training provisions are lacking. Several Finnish youth sports clubs have, themselves, set health promotion an important objective of their activities [19]. The current situation, however, appears that these macro level objectives have not yet converted into practical actions [17]. The concept of health promoting sport clubs has expanded to several countries over the recent years and been adopted and developed further [20]. Responsible alcohol use and restricting smoking have been essential components in health promoting sports clubs activities [13,21].

### *Substance Use in Sports Clubs*

Participation in sports club activities has been considered a risk factor for alcohol consumption, especially for binge-drinking [22]. In other words, sports club participants, despite drinking less frequently, drink more heavily per single occasions when compared with their non-participating counterparts [10]. There are differences in alcohol consumption between different sports, when alcohol consumption was more prevalent among participants in ball games, technical sports and aesthetic sports than among participants in endurance, power and weight-dependent sports [10,23]. There are also studies that have reported the associations between binge drinking and vigorous intensity physical activity [24,25].

Smoking is less frequent among sports club participants than non-participants [23]. Between different sports, smoking is less common among participants in endurance sports than in team sports, and this pattern seems to continue on into early adulthood [10]. In addition, higher intensity of physical activity is negatively associated with tobacco use [24].

The use of snuff (oral tobacco) is a common alternative to smoking, especially in the Nordic countries [26]. The use of snuff has been reported to be more common among sports club participants than non-participants [27]. Ice-hockey is an example of sports where many athletes, especially male, have reported regular snuff use in the Nordic countries [28].

Although a reasonable number of studies have investigated the associations between regular sports participation and substance use, other sports-specific details such as type of sport, training frequency, and sport related goal orientations have not previously been recognized in the literature. Possible confounders for the use of substances and sports clubs include the academic track of the adolescent. Lower school performance has been found to be associated with tobacco use [29], and also with the use of snuff [30]. Likewise, higher educational aspirations have been found to be associated with lower levels of risky behaviours and smoking rates [31].

The aims of this study were to investigate the associations between experience and use of substances (alcohol, smoking and snuff) and participation in sport clubs, as well as coaches' health promotion activities. In doing so, training volume, sport related goal orientation, educational aspirations and current school performance levels in adolescents are considered as potential confounders to the main findings.

## 2. Results

As represented in Table 1, there were contrasting differences in girls' experience with smoking, alcohol and snuff between members and non-members of sport clubs. In all cases, girls sports club members were significantly less exposed to experiencing substances. Similarly, boys sports club members were significantly less exposed to experiences of smoking than non-members. Experience of alcohol and snuff use was slightly higher among members, although this was not statistically significant.

**Table 1.** Substance experience among non-sport club members (NSCM) and sport club members (SCM) among girls and boys (%).

	Girls		Chi-Square	Boys		Chi-Square	Total <i>n</i> = 2113
	NSCM	SCM	<i>p</i> -Value	NSCM	SCM	<i>p</i> -Value	
	<i>n</i> = 511	<i>n</i> = 572		<i>n</i> = 402	<i>n</i> = 628		
Alcohol Experience			<0.001			0.612	
No experience	38.0	49.5		46.5	44.9		44.8
Experienced	62.0	50.5		53.5	55.1		55.2
Smoking Experience			<0.001			<0.001	
No experience	56.8	78.0		57.7	71.7		67.1
Experienced	43.2	22.0		42.3	28.3		32.9
Experience with Snuff			<0.001			0.434	
No experience	86.5	93.0		70.1	67.8		79.6
Experienced	13.5	7.0		29.9	32.2		20.4

Chi-square test of independence between sports club members (SCM from sports club data) and non-sports club member (NSCM from school data and sports club data file combined).

In Table 2, fewer boys reported current alcohol use than girls however, more boys experienced snuff use than girls after physical activity and academic aspirations adjusted the model. Adolescents with educational aspirations for vocational education or training were associated with current smoking (OR = 1.57, CI = 1.24–1.99) however, educational aspirations were not significant in current alcohol and snuff use. In addition, as school academic grades were lower, the association

with current alcohol, smoking and snuff use increased, when compared to peers with higher academic grades. Moreover, it was more likely for non-members of sports clubs to smoke.

**Table 2.** Adjusted odds ratios (OR) with 95% confidence intervals for the associations between current substance use and gender, academic grades and sports club membership.

	Alcohol			Smoking			Snuff		
	OR	LCI	UCI	OR	LCI	UCI	OR	LCI	UCI
Gender									
Girl	1.00			1.00			1.00		
Boy	<b>0.81</b>	<b>0.67</b>	<b>0.98</b>	0.86	0.70	1.06	<b>3.40</b>	<b>2.63</b>	<b>4.40</b>
Academic Grade									
High (>9.0)	1.00			1.00			1.00		
Moderate (7.5–8.9)	<b>1.93</b>	<b>1.54</b>	<b>2.41</b>	<b>2.25</b>	<b>1.69</b>	<b>2.99</b>	<b>2.35</b>	<b>1.61</b>	<b>3.44</b>
Low (<7.4)	<b>3.92</b>	<b>2.77</b>	<b>5.55</b>	<b>5.24</b>	<b>3.60</b>	<b>7.63</b>	<b>6.78</b>	<b>4.27</b>	<b>10.77</b>
Sports Club Member									
Yes	1.00			1.00			1.00		
No	0.97	0.78	1.24	<b>1.67</b>	<b>1.24</b>	<b>1.99</b>	0.93	0.70	1.23

OR—Adjusted odds ratio (in bold with statistical significance); LCI—Lower 95% confidence interval; UCI—Upper 95% confidence interval.

Table 3 represents the data from the athletes from 10 selected sports. Changes in educational aspirations, vigorous physical activity, goal orientation, competition level and training frequency were not statistically significant and are not shown in the Table. Snuff use was magnified to over five times in boys when compared to girls. Furthermore, participants of team sports were more likely to use snuff than individual sports. As with the first models, lower academic grades were associated with alcohol, smoking and snuff use compared to peers with higher academic grades. Provision by coaches of often or very often discussions on substance use as a health promotion activity was associated with more adolescents with alcohol, smoking and snuff use.

**Table 3.** Adjusted odds ratio (OR) with 95% confidence intervals for current substance use among sport club members and gender, academic grade, coach health promotion and sport type.

	Alcohol			Smoking			Snuff		
	OR	LCI	UCI	OR	LCI	UCI	OR	LCI	UCI
Gender									
Girls	1.00			1.00			1.00		
Boys	1.29	0.85	1.74	0.90	0.57	1.44	<b>5.61</b>	<b>2.94</b>	<b>10.70</b>
Academic Grade									
High (>9.0)	1.00			1.00			1.00		
Moderate (7.5–8.9)	<b>1.79</b>	<b>1.23</b>	<b>2.62</b>	<b>2.23</b>	<b>1.29</b>	<b>3.87</b>	<b>2.88</b>	<b>1.49</b>	<b>5.57</b>
Low (<7.4)	<b>2.50</b>	<b>1.24</b>	<b>5.06</b>	<b>4.71</b>	<b>2.09</b>	<b>10.62</b>	<b>7.78</b>	<b>3.07</b>	<b>19.74</b>
Coach Health Promotion									
None	1.00			1.00			1.00		
Seldom	1.20	0.85	1.72	0.97	0.61	1.55	1.06	0.63	1.77
Often	<b>1.80</b>	<b>1.09</b>	<b>2.98</b>	<b>1.77</b>	<b>1.02</b>	<b>3.08</b>	<b>2.59</b>	<b>1.43</b>	<b>4.70</b>
Sport Type									
Individual	1.00			1.00			1.00		
Team	1.32	0.93	1.89	1.43	0.88	2.32	<b>1.78</b>	<b>1.01</b>	<b>3.14</b>

OR—Adjusted odds ratio (in bold with statistical significance); LCI—Lower 95% confidence interval; UCI—Upper 95% confidence interval.

### 3. Discussion

In this study, substances use (alcohol, smoking and snuff) among youth were investigated in relation with sports clubs membership and coach health promotion activities. In addition, associations between substance use and academic performance were significant. According to the main result of this study, there was an increased association between often counselling of specific substances by the coaches with athletes' substance use. Coaches have been found to have positive orientation towards promoting of health in sports clubs, but the practice and policies of clubs often fail to support such aims [18]. In addition, coaches have often perceived health promotion in sports clubs to be more related to the prevention of illness, injury prevention/safety promotion and sleep, rather than the use of substances [32]. As such, it is likely that coaches have provided these discussions about substance use as reactive actions to alcohol use in the sports club, rather than as a preventative means. Kokko and Paakkari [16] have argued that in an informal learning setting such as youth sports clubs, coaches have three modes for health promotion—implicit, reactive and deliberate. Reactive mode would fit into the results of this study, i.e., coaches reacting and discussing substances only after substance use already has occurred. Coaches may lack sufficient knowledge to deliver health promoting messages which would influence the way coaches' present discussions about substance use. Therefore, challenges in health promotion in sports clubs are to encourage coaches to take part in appropriate education that can improve their contribution to the reduction of substance use in sports. Coaches are known to be less inclined to attend training for health promotion [33], but this would be important if they were expected to be influential regarding substance use in clubs.

Another main result of this study was; experiences with substances were associated with lower academic grades. In other words, where there were low school performances, there have been more experiences to substances and its usage. Previous studies have reported similar results [29,30]. In addition, the predictability from the models doubled as the groups changed from moderate GPA to low GPA when compared to high GPA. The difference in the predictability of academic grade in alcohol use was the least, whilst snuff use was the greatest at approximately eight times more. Latvala and colleagues [29] also reported continued use of alcohol and smoking was associated with poor academic performance, and that the correlations for academic performance were stronger for smoking behaviours. In earlier studies, snuff use was also greater among low academic achievers than smokers [30]. Health risks from taking snuff are considered to be of a lower magnitude than those from smoking [26]. Therefore, planning health promotion against snuff use needs to take into account the social bonding linked with snuff use [34] rather than education and the strive for higher academic attainment. Furthermore, these results highlight the importance of overall educational attainment in adolescents, including sports club participation, when addressing substance use among adolescents.

Sports club membership was associated with less smoking. The effect of smoking on performance has been well documented [35]. However, alternative tobacco products are also common. Snuff use was more prevalent in boys than in girls, but there were no differences between members and non-members of sports clubs in boys. Users of snuff have reported the social benefits of using snuff, which is exclusively amongst males [34]. The popularity of snuff use has recently increased among Finnish young men [28]. The men that were interviewed in Helme and colleagues' study, stated the social bonding far outweighed the health benefits of not taking part [34]. There were also increased odds with snuff use among sport club members of team sports, thus highlighting these masculine bonding behaviours often found in team sports [36]. In a sports team environment, the first experience of substances may be perceived to be safer than to try substances for the first time in other environments. Whereas, where there is less team bonding, such as through individual sports, there are fewer chances to be in contact with others that use substances. Health education can play an important role in strategies to reduce the levels of snuff use, particularly at a time when adolescents are seeking ways of self-discovery and maturity into adulthood [37].

Fewer adolescent girls that take part in sports clubs reported to have experienced substances of smoking, alcohol and snuff than their counterparts who do not participate in sports clubs. This finding

is in line with previous research whereby the sports club offer an environment favourable for adopting a healthy lifestyle [2]. Halldorsson and colleagues [38] suggested taking part in sports clubs buffers overall alcohol use, particularly when alcohol consumption is contingent on having friends that consume alcohol.

The boys' experiences with substances were not as consistent as in girls, since there were no differences in alcohol or snuff experiences between members and non-members of sports clubs. Smoking has been shown to have harmful effects for performances [10] and it may be that boy sports club members know less about the influence of alcohol and snuff on the body for sports. This is one area where further work in health promotion is much needed, with particular focus on boys' sports. As Hickey and colleagues [6] suggest, administrators of sports clubs have to provide a much better environment that does not encourage alcohol use and its association with sports participation [6]. However, this is much more complex in practice, as substances have been found to be the least noticed health topic areas by both the clubs and coaches [17,32]. Interventions in this area are still rare. Geidne and colleagues [13] have found that alcohol policies can be adopted in football clubs if well planned and Rowland and colleagues [14] have found some links between clubs' alcohol management practices and risky drinking behaviours. There is a need for more research in this particular area.

Some limitations are worth noting when considering the interpretations of this study. The data collected was cross-sectional. Therefore, causality remains unknown. In particular, the coach may have made adolescents aware of substances, which they experimented with and thus could have been a reason for the increased substance use. However, our discussions have been based on theoretical premise of coaches' behaviours and provisions of education [16] since, we cannot be sure of causal links between the experience of substances and coaches' activities. The data collected was from self-reported online questionnaires, and there may be some recall bias. Respondents were from the most common sports in Finland, and other sports were not included. Health promoting sports clubs do exist outside of the sports from where the athletes were selected from, and future studies may consider involving these sports, with longitudinal designs and involving various sources, such as coaches, parents and officials.

## 4. Materials and Methods

### 4.1. The Sample and Data Collection

This study is part of the multidisciplinary Health Promoting Sports Club (HPSC) study conducted in Finland by the University of Jyväskylä with six sports and exercise medicine centres and the UKK Institute [38]. Participants aged between 14–16 years old from the 10 most popular sports in Finland were asked to participate in the study during 2013. Twenty-four sports clubs in each of the 10 sports that were located within the same regions as the sports and exercise medicine centres were contacted. Almost two-thirds (64%) of these clubs participated in the HPSC study. A response rate of 35.5% ( $n = 671$ ) of the invited 1889 sports club participants (club members) completed the online questionnaire. Two-thirds (66%) of participants were from team sports (basketball, floorball, football, ice-hockey, team gymnastics), the remaining third from individual sports (cross-country skiing, orienteering, skating, swimming and athletics). Only two participants did not report if they took part in individual or team sports. Specific details about the study protocol, sampling and grouping procedures are available from another source [33]. The HPSC study received ethical approval from the Ethics Committee of Health Care District of Central Finland (record number 23U/2012).

A comparison sample of non-participating adolescents (non-members) was also recruited. Adolescents, aged 14–16 years old were invited to take part in the study through their schools. Schools were selected to match the data collected from the sports clubs based around the six sports and exercise medicine centres. One class per school was selected through simple random sampling. In total, 2074 pupils were asked to participate in the study during the normal school day, and 1442 participants from 100 secondary schools took part (response rate 69.5%).

An item about sports club participation in the comparison questionnaire was included. The majority of respondents reported they were not participants of sports clubs (63.3%), and less reported to be sports club members (36.7%). After combining the data sets from the club members and non-members, duplicate responses were removed from the comparison questionnaire through a unique identifier as specified in the study protocol [33]. Therefore, the final data set was treated with two purposes; (i) to examine the differences between members and non-members, irrespective of the sport, (ii) to examine the behaviours from athletes in the 10 most popular sports in Finland.

## 4.2. Measurements

### 4.2.1. Substance Use Variables

Survey items that measured substances (alcohol, smoking and snuff) have been used extensively in the initial HPSC study [1] and previous HBSC (Health Behaviour in School-Aged Children) studies [39]. Variables were based on the following:

**Alcohol:** Adolescents were asked if they had ever consumed alcohol and response options were “yes” and “no”.

**Smoking:** Adolescents were asked if they have tried smoking with the response of ‘yes’ or ‘no’.

**Snuff:** Adolescents were asked if they had any experience of snuff and response options of; “never”, “one or two times”, “more than twice”. The latter two options were combined for the analysis.

For each substance item, respondents were asked to report their current frequency, only if they had previously indicated they had experienced it. The response options ranged in frequencies depending on the substance, i.e., smoking and snuff was based on daily, weekly, less frequently, and response options for alcohol use were based on “at least half bottle of medium strength beer or more”, on weekly, bimonthly, monthly, seldom frequencies. For each substance, a response category of “not using” was available. All responses of “not using” were combined with “no experience” to create a variable of “no experience or not using” as the reference category in the analysis. Due to the skewed distributions of response categories other than “not using”, the dependent variables were dichotomized (no current use vs. current use) to ensure an adequate amount of cases to perform reliable multivariate regression analyses.

### 4.2.2. Descriptive Variables

Measures of physical activity (PA) were reported through a self-reported item about the frequency of vigorous physical activity (PA). This particular item has acceptable reliability and validity against an objective measurement of physical activity [39]. Adolescents were asked to report the number of times they took part in vigorous PA in the out of school hours context. The response options were: “daily”; “4–6 times a week”; “2–3 times a week”; “once a week”; “once a month”; “less than once a month”; “never”. The participants were categorized according to international recommendations of PA for health with at least three times a week [40]. As in previous studies [39], the chosen cut off for dichotomous analyses was set at active (daily and 4–6 times a week) to ensure all those that reported behaviours to at least meet the recommendations, to less active (never, less than once a month, once a month, once a week, 2–3 times a week).

Educational aspirations were measured by the question: “What do you think you will do when you finish comprehensive school?” The answer options were, “try to enter general upper secondary school”, “try to enter vocational school/work”, “try to get an apprenticeship/training”, “double examination (e.g., general upper secondary school and vocational school)”, “get a job”, “be unemployed”, “I don’t know”. Respondents that mentioned their aspirations were “I don’t know” ( $n = 91$ ) and “be unemployed” ( $n = 6$ ) have a different aspirational direction to either general upper secondary school or vocational education/training, and were excluded from the analysis. All other analyses were dichotomized into the reference group of aspiring for general upper secondary

school and the group of vocational aspiration (try to enter vocational school/work, try to get an apprenticeship/training, double examination, get a job).

The Finnish school academic grading system is on a ten point scale, with 0–4 representing the failing marks. Respondents were asked to report the most recent school report grade point average to the nearest half point. For the analyses, three groups were formed, low performers (less than 7.5), moderate performers (between 7.5–8.9), and high performers (9.0 and above). These were grouped based on the average expectation to enter general upper secondary school around Finland can be approximately to 7.5 and above, and over 9 is rated as very good.

#### 4.2.3. Sports Specific Variables

Participants in sports clubs were asked a number of items that could confound the results. There variables were identified to be goal orientation of athletes, competition of athletes, training frequency and sport types. The athletes that were recruited from certain sports were grouped as “team” and “individual” sports.

The coaches’ health promotion advice in the sport clubs was assessed with the question: “How often in the past six months has your head coach given you counselling on health related issues?” This question set included 12 health topics of which three substances; alcohol, smoking, and snuff, were used in the analysis. The response options included, “never”, “seldom”, “often” and “very often”. “Often” and “very often” were group together, leaving three categories in the analysis. Only the relevant substance was included in the statistical model. In other words, in the statistical model of experience of smoking, the coaches’ advice on smoking was included and not the other substances. The same was entered for matching alcohol advice and alcohol experience, as well as counselling on snuff use and experience of snuff.

The goal orientation of the sport participants was determined by asking the athletes the level of competition that the athlete would like to pursue. Three groups were classified and distributed in percentages as, “no competitive goals” (20%), “junior level competitive goals” (60%), and “adult level competitive goals” (20%).

Sports competition level of the athletes was reported by the athlete in an item that asked the athlete what level of competition they take part in. For the analysis, two groups (distribution in %) were formed into “National level” (65%) competitions and “all other levels” (35%) (other competitions, local, neighbourhood, or not competing).

Athletes were asked to provide information about their typical training week. This included the number of hours spent in three different training sessions; coach led sessions, independent sessions and competition. The totals for each training session were summed to give an overall training frequency. In this sample, the range was from 0 to 27 h with a mean of 6.9 h (SD = 2.9) and an interquartile range of 5–8 h.

#### 4.3. Data Analysis

Data analysis began with descriptive statistics of experience of substances among genders and sports club membership. Pairwise associations between the categorical variables were assessed with cross tabulation and Chi-squared tests of independence. The significance level was  $p < 0.05$  in these statistical tests.

The factors associated with experience and use of substances among adolescent sports club members were analyzed using multiple binary logistic regression analysis. Adjusted odds ratios (OR) were estimated with 95% confidence intervals (CI). The first sets of models predicted the differences in substances with members and non-members of sport clubs. Gender, school academic grade, educational aspirations, and membership of sport clubs were included in a different model for alcohol, smoking, and snuff use. The second set of models extended on the first model however, included only the data from the athletes from the 10 sports. The coaches’ health promotion behaviours of the specific substance were included as a categorical variable in the substance specific models. Training frequency



was entered as a continuous variable, whereas, goal orientation, individual or team sport classification, and sports competition level were entered as categorical variables.

#### 4.4. Ethical Issues

The study was carried out in conformance with the declaration of Helsinki. Ethical approval was granted for the study by the Committee of Health Care, District of Central-Finland (record number: 23U/2012). After the permission was obtained, all respondents were notified of their option to refuse to participate and withdraw from the study at any time [33].

## 5. Conclusions

Greater prevalence of substance use was associated with coaches' health promotion activities concerning substance use. Experience of substance use was associated with lower academic grades, suggesting alternative messages for different levels of academic attainment would be needed, also in sports clubs. Fewer girls that were members of sports clubs had experiences with alcohol, smoking or snuff than their counterparts who were not members of sports clubs. Protective factors from exposure to substances were additional benefits through participation in organised sports. More work would be needed to prevent boys experiencing alcohol and snuff in sports club settings. Fewer sports club members smoked, although there are alternative tobacco substance in sports cultures. Snuff use was more popular among boys than girls. Boys that were in team sports were more exposed to snuff use than in individual sports. Overall, there is a clear need for multi-level intervention on substance use prevention for sports clubs, coaches and participants. For coaches, more effective education on substance-related matters would be needed to reduce the use of substances in sports clubs, especially for boys.

**Acknowledgments:** This work was supported by the Ministry of Education and Culture (major, grant number: 6/091/2011), and the Ministry of Social Affairs and Health (minor, grant number: 152/THL/TE/2012).

**Author Contributions:** KN, KM, SK and LK conceptualised and designed the study. SK is the PI for the HPSC study and he together with JP, LK, TV, OH, KS, LA, RK and HS substantially contributed to the design and production of the study. JV, KN and KM analysed the data. KN, KM, SK and LK wrote the paper. All authors contributed to the interpretation of data, commented on drafts of the manuscript and read and approved the final manuscript.

**Conflicts of Interest:** The authors declare no conflict of interest. The founding sponsors had no role in the design of the study; in the collection, analyses, or interpretation of data; in the writing of the manuscript, and in the decision to publish the results.

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