


## Adolescents' beliefs, attitudes and social norms with regard to smoking and sports: A qualitative study

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# BMJ Open Adolescents' beliefs, attitudes and social norms with regard to smoking and sports: a qualitative study

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## ABSTRACT

**Objectives** The aim of this study is to explore the beliefs, attitudes and social norms of Dutch adolescents with regard to smoking and sports. In addition, we examine whether there are differences between adolescents at sports clubs with versus without an outdoor smoke-free policy (SFP).

**Design** Qualitative design in the form of focus group interviews.

**Setting** Focus group interviews (n=27) were conducted at 16 sports clubs in the Netherlands. Soccer, tennis, field hockey and korfbal clubs were included. Focus group discussions were transcribed verbatim and analysed thematically using MAXQDA.

**Participants** 180 adolescents aged 13–18 years old were included in the study. All participants signed an informed consent form. For participants younger than 16 years, parental consent was required.

**Results** With respect to smoking in relation to sports, participants had mostly negative beliefs (ie, smoking has a negative effect on health and sports performance), attitudes (ie, sports and smoking are activities that do not fit together; at sports clubs smoking is not appropriate), and social norms (ie, it is not normal to smoke at sports clubs). The same beliefs, attitudes and social norms were expressed by participants at both sports clubs with and without an outdoor SFP. However, argumentation against smoking was more detailed and more consistent among participants at sports clubs with an outdoor SFP.

**Conclusion** Adolescents have negative beliefs, attitudes and social norms with regard to smoking in relationship to sports. Outdoor SFP at sports clubs might reinforce these negative associations. These findings point to the potential importance of sports in the prevention of adolescent smoking.

## INTRODUCTION

Smoking initiation often takes place during adolescence<sup>1</sup> and is influenced by many factors, including beliefs (the feeling of being certain that something exists or is true), attitudes (positive or negative predispositions towards a behaviour), and social norms (the social pressure to perform a behaviour).<sup>2</sup> These three constructs shape an individual's intentions which, according to the Theory of Planned Behavior (TPB), influence changes

## Strengths and limitations of this study

- First study to use qualitative methods to explore in greater depth the views of adolescents regarding smoking and sports.
- Data were collected through focus group discussions with both genders at 16 sports clubs located in all four regions of the Netherlands.
- Need for peer approval may have induced socially desirable responses.

in smoking behaviour.<sup>3</sup> The TPB has proven to predict adolescents' smoking behaviour,<sup>2,4</sup> for example, negative attitudes towards smoking predict intentions not to smoke.<sup>2,5</sup> In addition to such individual-level factors, the smoking behaviour of adolescents is influenced by the different activities they undertake, the environments in which they live and by their peers. Performing sports and being present at sports clubs may play an important role in relation to smoking behaviour, since many adolescents participate in sports,<sup>2,6</sup> peers are present and sports clubs are environments where important role models are present.

Previous studies have examined the relation between smoking and sports among adolescents.<sup>2,7–11</sup> According to these studies, adolescents performing sports are less likely to smoke than those not performing sports. The likelihood of smoking depends on the level of involvement in sports<sup>4,6,7</sup> and the kind of sport,<sup>8</sup> with higher involvement and high-endurance sports being more protective. More generally, adolescents who engage in sports with a greater level of physical activity are less likely to smoke or smoke fewer cigarettes per day than adolescents who engage less.<sup>12–18</sup>

The inverse association between smoking and sports may have several explanations. Sports participation is not only associated with actual smoking, but also with attitudes towards smoking. Positive attitudes towards



exercise are found to be associated with negative attitudes towards smoking.<sup>2</sup> Next to this, adolescents participating in sports may have an increased awareness of the detrimental effects on health and performance. They receive more information about health and health risks and may therefore be more aware of the negative consequences of smoking.<sup>9</sup>

Yet, the evidence explaining the links between smoking and sports remains meagre. Previous studies on smoking and sports used quantitative approaches, either as part of randomised trials<sup>2 7 11</sup> or longitudinal studies.<sup>8–10</sup> To the best of our knowledge, there are no published studies that used a qualitative approach with the aim to gain in-depth knowledge of adolescents' beliefs, attitudes and social norms towards smoking and sports, while this is needed to fully understand adolescents' perceptions.

Internationally, an increasing number of sports clubs are implementing outdoor smoke-free policies (SFPs), among others, to prevent secondhand smoking and to protect youth against smoking.<sup>19</sup> Outdoor SFPs can help discourage the onset of adolescent smoking by reducing the visibility of smoking, limiting the opportunities to smoke and communicating that smoking is socially unacceptable.<sup>20–23</sup> However, to the best of our knowledge, there are no published studies on adolescent smoking in relationship to outdoor SFP at their sports clubs.

The aim of this study is to explore the beliefs, attitudes and social norms of Dutch adolescents with regard to smoking and sports. In addition, we examine whether there are differences between adolescents at sports clubs with versus without an outdoor SFP. We aim to gain an in-depth understanding of adolescents' perspectives by conducting focus group discussions.

## METHODS

### Design

A qualitative approach was chosen to obtain in-depth information about adolescents' beliefs, attitudes and social norms with regard to smoking and sports. A qualitative design is a particularly useful method when investigating an under-researched area, or when participants' views on the topic are unknown.<sup>24</sup>

### Participants

A total of 16 Dutch sports clubs were included in the study, of which there were 8 with an outdoor SFP and 8 without an outdoor SFP (see [table 1](#)). The sports clubs were located in different regions in the Netherlands. Four major Dutch sports were included: soccer, tennis, field hockey and korfbal. These sports differ in terms of socioeconomic status (SES) of their members and in team composition. Participating clubs (n=16) did not significantly differ from non-participating clubs (n=49) in terms of type of sports and level of urbanisation. Sports clubs were contacted either face-to-face or by phone, email and/or letter. The main reasons for non-participation

**Table 1** Characteristics of the participating sports clubs (n=16)

	No of sports clubs n=16	With an outdoor SFP n=8	Without an outdoor SFP n=8
<b>Sports</b>			
Soccer	5	2	3
Korfbal	4	2	2
Field hockey	4	2	2
Tennis	3	2	1
<b>Size (members)</b>			
<250	4	1	3
250–500	3	3	0
500–1000	6	3	3
1000–1500	3	1	2
<b>Level of urbanity</b>			
Highly urbanised	3	2	1
Urbanised	4	3	1
Moderately urbanised	2	1	1
Rural	6	2	4
Highly rural	1	0	1

SFP, smoke-free policy.

were lack of interest (n=22), not having enough participants (n=11) and lack of time (n=8).

At each sports club, focus group discussions (n=27) were conducted with adolescents aged 13–18 years old. Per club, two focus group discussions were conducted, with an exception of five clubs where only one focus group discussion was conducted because there were not enough boys or girls to form groups for both genders. Groups were divided by gender as adolescents' responses might be influenced by the presence of the other gender.<sup>25</sup> A total of 180 adolescents participated in the study. [Table 2](#) presents the characteristics of the participants, including gender, age and smoking status.

### Patient and public involvement

No patients were involved.

### Procedure

The field study was conducted from May 2019 to December 2019 in collaboration with Sportief Advies (SA), a Dutch organisation that supports projects with regard to sports and culture. SA was responsible for recruiting the sports clubs.

### Focus group discussions

Focus group discussions were conducted by the first two authors (IGO and HHG) and took place at the participating sports clubs. The discussions were audio-recorded and lasted on average 20 min (range 12–29). All participants signed an informed consent form. For participants

**Table 2** Characteristics of the participants (n=180)

	No of participants n=180		With an outdoor SFP n=89		Without an outdoor SFP n=91	
		%		%		%
<b>Gender</b>						
Boy	72	40.0	37	41.6	35	38.5
Girl	108	60.0	52	58.4	56	61.5
<b>Age</b>						
13	9	5.0	4	4.5	5	5.5
14	35	19.4	18	20.2	17	18.7
15	61	33.9	33	37.1	28	30.8
16	44	24.4	20	22.5	24	26.4
17	23	12.8	11	12.4	12	13.2
18	8	4.4	3	3.4	5	5.5
<b>Smoking status*</b>						
Smoker	12	6.7	2	2.3	10	11.0
Non-smoker	168	93.3	87	97.8	81	89.0

\*Defined by whether or not they smoked in the last 30 days.  
SFP, smoke-free policy.

younger than 16 years, parental consent was required. Participants received a €10 gift voucher for their participation.

At the start of each discussion, the interviewer explained the purpose of the study and the participants' rights as confidential participants in scientific research. Hereafter, the interviewer asked the participants to fill out a questionnaire regarding their gender, age and smoking status. All focus groups started with initial 'icebreaking' questions (How long have you been a member of this club? How would you describe the club?), followed by questions based on the psychological constructs (beliefs, attitudes and social norms) of the TPB. The topic guide can be found in online supplemental appendix 1. The interviewer aimed to keep the group discussion focused on the topic and to ensure that all participants had the opportunity to contribute (using phrases such as 'And what do you think about this?').

### Analysis

Focus group discussions were transcribed verbatim and analysed using MAXQDA. Thematic analysis was applied, which is a qualitative method for identifying, analysing and reporting patterns or themes within a dataset.<sup>24</sup> The coding was performed inductively by the first author (IGO). To ensure intercoder reliability, the second author (HHG) co-coded 10 transcripts. Inconsistencies in coding were discussed until consensus was reached. Thereafter, the list of codes was further analysed by combining similar codes and forming larger codes. Next, the larger codes were divided into beliefs, attitudes, and social norms on the individual and sports club level, based on the definitions of the three concepts.

### RESULTS

Four categories were derived from the data: (1) beliefs on individual level, (2) attitudes on individual level, (3) attitudes on sports club level and (4) social norms on sports club level (see [table 3](#)). We first describe the findings within these four categories, followed by the differences that were found at sports clubs with an outdoor SFP versus without an outdoor SFP.

#### Individual level Beliefs

According to the majority of the participants, smoking negatively affects sports performance (see [table 3](#)—beliefs on individual level). Participants mentioned that those negative effects are mainly physical, that is, a decline in physical condition, decreased lung capacity and breathlessness. Participants consistently stated that the decline in physical condition diminishes sports performance. Although participants mostly mentioned the physical effects of smoking, a few participants mentioned that smoking could have a negative effect on mental health and responsiveness.

However, a few participants emphasised that smoking does not affect technical aspects of sports performance such as the throwing technique in korfbal. Highly skilled athletes may perform well even if they smoke. Similarly, some current or past smokers emphasised that they did not experience an effect of starting/quitting smoking on their sports performance. Participants also expected only minor negative effects for those who do not smoke frequently; adolescents participating in sports experience negative effects only when smoking daily or weekly.

**Table 3** Overview of adolescents' beliefs, attitudes and social norms towards smoking and sports

Categories	Subcategories	With an SFP	Without an SFP	Quote
Individual-level beliefs	Smoking does affect your sports performance	X	X	'...if you smoke and do sports, I think it's going to be a little harder to do sports. It gets you out of breath faster too. So, if you want to do sports, that's not so convenient.'
	Smoking weakens your physical condition	X	X	'Smoking just simply deteriorates your physical condition.'
	Smoking weakens your physical condition, which also makes you less able to perform sports	X	X	'Smoking deteriorates your condition, so you can't exercise for as long, you don't last as long...'
	Smoking affects your lung capacity	X	X	'It just doesn't come in handy when you're exercising. Because you want to have a lot of lung capacity, and smoking doesn't help with that.'
Attitudes	Smoking affects your cognition	X	X	'So, when you exercise, all you think about is cigarettes. So, it also affects your mentality, mentally.'
	Smoking does not affect your sports performance	X	X	'Not that you can't smoke when doing sports, but they don't have anything to do with each other. But I don't think your sports performances are affected when you smoke, I think.'
	Quantity of cigarettes affects your sports performance	X	X	'If you, so to speak, do it just once a month or so, I don't think it necessarily has any effect. But if you do it daily or weekly...then I think it does have an effect.'
	Sports compensate for smoking	X	X	'...but I think you're kind of compensating, not very much, but a little bit.'
Sports club-level attitudes	Sports do not compensate for smoking	X	X	'Of course, you exercise to get better, and if your physical condition gets worse when smoking, there's no use at all anymore.'
	Smoking is bad for all sports	X	X	'I think it's both equally bad, for both the soccer player and the tennis player, it comes down to the same thing.'
	Smoking and sports do not fit together	X	X	'It sounds strange, but I think it's a weird combination, with sports you're healthy but with smoking you're unhealthy. So that's not a good combination, you'd say.'
	Smoking and high-level sports do not fit together	X	X	'Well, it depends on what level you're playing. If you do paid class, it's fine. I think if you're serious about high-level sports, it doesn't really go together, no.'
Social norms	Smoking and sports do fit together	X	X	'I guess it's okay, right?'
	Smoking and sports clubs do not fit together	X	X	'Yes, in a pub, it's okay...at least in a pub, you'd expect to smoke rather than at a sports club.' 'Yes, sports are more for your health and yes, a pub is for your pleasure, to have fun. So that's a better fit than it is here.'
	Smoking and sports clubs do fit together	X	X	'But before, I didn't think it was weird when someone lit a cigarette; it happens everywhere. So, I don't think it should suddenly be very different at a sports club than when you walk around town or something like that. I don't understand that difference...I wouldn't necessarily know why it should be like that.'
Social norms	Smoking is not normal at sports clubs	X	X	'Well, it's more like, I don't think it's normal at our club. So, if somebody were to stand there and smoke, yeah, I think it'd get a really weird reaction.'
	Smoking is not normal among young people at the sports club	X	X	'...if you lit a cigarette as a minor, it'd be looked at strangely.'
	Smoking is normal at village clubs	X	X	'Yes, I think that at village clubs it's pretty normal that a few people smoke. Not that everyone agrees with it, but that it's just tolerated at the club.'
Social norms	More people smoke at soccer	X	X	'I think more at soccer or tennis, where a lot more people smoke.' 'Yeah, a lot in soccer. All those old men.'
	Smoking is normal among adults at the sports club	X	X	'A lot of young people smoke at soccer, too. From 16, 17 years old.' '...when adults light a cigarette, no one's surprised.'

The X indicates at which sports clubs the beliefs, attitudes and social norms were reported. SFP, smoke-free policy.

Furthermore, a few participants argued that participating in sports can compensate for the negative effects of smoking on one's physical condition in general, that is, one's condition may be less affected by smoking if one participates in sports. However, none of the participants said that sports would prevent the harmful effects of smoking with regard to disease, such as the onset of lung cancer.

### Attitudes

The majority of the participants believed that smoking and sports do not fit together (see [table 3](#)—attitudes on individual level). This attitude was commonly based on the straightforward observation that sports are healthy, while smoking is unhealthy. Participants thought that smoking is especially not appropriate for adolescents participating in sports on a higher level, while it may be acceptable for adolescents participating in sports on a lower level, and especially for those who play sports mainly for fun.

### Sports club level

#### Attitudes

According to the participants, sports clubs are not somewhere smoking ought to be present (see [table 3](#)—attitudes on club level). Their straightforward reasoning is that sports clubs are oriented towards sports and health, which are at odds with the habit of smoking. Participants recognised that sports clubs are places where people like to come together and that smoking could accompany social activities. Nevertheless, as the social function of clubs is subordinate to their athletic, competitive function, sports clubs are not the place where smoking should be tolerated to the same degree as elsewhere (such as at outdoor bars/restaurants or at nearby schools).

#### Social norms

Most participants were clear regarding the descriptive social norm: it is not normal to smoke at sports clubs (see [table 3](#)—social norms on club level). This applies especially to adolescent smoking. Youth smoking is not considered as normal behaviour at sports clubs, while smoking among adults may be more common at some sports clubs.

Some participants reported that there are differences between sports clubs regarding the social norms of smoking. It was argued that smoking was more normal at clubs in small villages, where teams are often composed of friend groups and the main goal is to have fun when practising sports. Furthermore, smoking was said to be more normal at soccer clubs than in other types of sports such as at 'high class' hockey clubs.

### Differences between sports clubs with versus without an outdoor SFP

Overall, participants at sports clubs with versus without an outdoor SFP reported the same types of beliefs, attitudes and social norms with regard to smoking and sports. However, there were some differences in the frequency and detail in which arguments were mentioned. Participants at sports clubs with an outdoor SFP were more

specific and consistent in their reporting of negative beliefs and attitudes towards smoking in relation to sports ('Smoking just simply deteriorates your physical condition'). At clubs without an outdoor SFP, participants expressed more uncertainty in their statements ('I guess it's ok, right?'). In addition, the latter participants more often mentioned exceptions or situations where smoking could be tolerated.

## DISCUSSION

### Key findings

This study shows that adolescents have mostly negative beliefs (ie, smoking has a negative effect on health and sports performance), attitudes (ie, sports and smoking are activities that do not fit together; at sports clubs smoking is not appropriate), and social norms (ie, it is not normal to smoke at sports clubs) with regard to smoking and sports. Even though adolescents at sports clubs with an outdoor SFP expressed the same beliefs, attitudes and social norms as those at clubs without an outdoor SFP, they had more detailed and consistent arguments against smoking.

### Interpretations of these findings

The finding that most adolescents believe that smoking has a negative effect on sports performance is in line with existing research that suggests that athletes believe smoking will hurt their performance and compromise their chances of success. They are more likely to perceive smoking as a danger to their health.<sup>9</sup> Compared with those not participating in sports, adolescents participating in sports are more exposed to health information and health counselling about the harmful effects of smoking (eg, from their coach or trainer).

A consistently voiced attitude of most participants was that smoking and sports do not fit together. Bebetso et al<sup>2</sup> also found that positive attitudes and behaviours towards exercise are associated with negative attitudes and behaviours towards smoking. Encouraging adolescents to practise sports can reinforce the positive attitudes towards smoking, given that smoking is perceived to conflict with sports.<sup>16 26</sup> However, it is important to be aware that participating in sports might have the adverse effect of enhancing the use of alcohol. Systematic reviews have concluded that participating in sports is associated with a lower use of tobacco and illicit drugs, although that it tends to be associated with an increased use of alcohol.<sup>15 16 26–28</sup> Smoke-free sports policies preferably include measures to prevent alcohol use by adolescents.

According to adolescents, sports clubs are places where young people do not smoke and are not allowed to smoke. While these social norms may logically derive from the beliefs and attitudes discussed above, they may be reinforced by the fact that parents are often present at sports clubs. When adolescents especially do not want parents and peers to know about their cigarette use, the



presence of parents and peers can deter adolescents from smoking at sports clubs.<sup>6</sup>

Even though adolescents do not associate sports clubs with youth smoking, smoking by adults is perceived as more normal. This might relate to the view that sports clubs should protect children and adolescents against smoking, but have no 'patronising' role towards adult members.<sup>6,29</sup> Our participants argued that youth in particular should be protected against smoking to prevent the onset of smoking.

Smoking is thought to be normal at clubs in small villages and at soccer clubs. This variability in descriptive social norms indicates that adolescents differentiate between types of sports and sports clubs. Adolescents perceive clubs in smaller villages as being more convivial, with more emphasis on social functioning than sports performance. Similarly, the perception that smoking is more normal at soccer clubs may be derived from the lower SES of most soccer clubs and the perception that smoking is mostly a habit of people with a low SES.<sup>30</sup>

We found that argumentation was more detailed and consistent among adolescents at sports clubs with an outdoor SFP. This may reflect the fact that implementation of an SFP is found to be followed by changes in the beliefs, attitudes and social norms of those exposed to the SFP, possibly because of reductions in the visibility of smoking and its perceived acceptability.<sup>20 22 31 32</sup> Thus, implementation of an outdoor SFP at sports clubs may have strengthened adolescents' negative beliefs, attitudes and social norms towards smoking and sports.

### Strengths and limitations

This is the first study to use qualitative methods to explore in greater depth the views of adolescents regarding smoking and sports. We performed focus group discussions at different sports clubs located in all four regions of the Netherlands. Focus group discussions have the advantage of producing rich data from the interaction between group members. As a result of this interaction, focus group discussions generate more information than the sum of individual inputs. Adolescents participating in focus group discussions hear the opinions of others, which can encourage them to respond to these ideas or suggest new ideas of their own.<sup>25 33</sup> Nevertheless, one limitation needs to be considered. The intense need for peer approval and declining social trust during adolescence can affect the information adolescents are willing to share in a focus group,<sup>34</sup> and may have induced socially desirable responses.<sup>35</sup> However, although most adolescents expressed negative beliefs, attitudes and social norms with regard to smoking and sports, other adolescents also felt free to express opposing views. Moreover, a few additional interviews that we had with individual adolescents, including smokers, disclosed no other views than those voiced in the focus groups.

### CONCLUSION

Adolescents' negative beliefs, attitudes and social norms with regard to smoking and sports are well worth the attention of those interested in preventing adolescent smoking. With many adolescents involved in sports, sports participation could potentially be a major contributor to preventing tobacco use. First, programmes aimed at changing adolescents' smoking behaviour could refer to values associated with sports, or link up with sports activities. Second, sports can be a protective factor in settings where smoking may still be prevalent, including areas near schools, by stimulating that these settings are dedicated to sports activities. Third, health-promotion activities at sports clubs may focus on the fact that some adolescents still have positive beliefs, attitudes and social norms with regard to smoking and sports. Finally, the potentially protective role of SFPs, including smoke-free sports clubs, must be acknowledged in order to promote their adoption at increasingly more sports clubs.

**Contributors** IGO, HHG, lvdG, AEK and ADR have made substantial contributions to conception and design, acquisition, data and interpretation of data. IGO and HHG analysed the data. IGO drafted the article. HHG, ADR, AEK and lvdG revised it critically for important intellectual content. All authors read and approved the final manuscript.

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### REFERENCES

- 1 World Health Organization. Tobacco use in adolescence. Available: [https://www.euro.who.int/\\_\\_data/assets/pdf\\_file/0016/303532/HBSC-No.7\\_factsheet\\_Tobacco.pdf](https://www.euro.who.int/__data/assets/pdf_file/0016/303532/HBSC-No.7_factsheet_Tobacco.pdf)
- 2 Bebetos E, Papaioannou A, Theodorakis Y. University Students' Attitudes and Behaviours Towards Smoking and Exercise. *European Journal of Physical Education* 2003;8:29–51.
- 3 Ajzen I. The theory of planned behavior. *Organ Behav Hum Decis Process* 1991;50:179–211.

- 4 O'Callaghan FV, Callan VJ, Baglioni A. Cigarette use by adolescents: attitude-behavior relationships. *Subst Use Misuse* 1999;34:455–68.
- 5 Higgins A, Conner M. Understanding adolescent smoking: the role of the theory of planned behaviour and implementation intentions. *Psychol Health Med* 2003;8:173–86.
- 6 Sigfúsdóttir ID, Thorlindsson T, Kristjánsson AL, et al. Substance use prevention for adolescents: the Icelandic model. *Health Promot Int* 2009;24:16–25.
- 7 Horn K, Branstetter S, Zhang J, et al. Understanding physical activity outcomes as a function of teen smoking cessation. *J Adolesc Health* 2013;53:125–31.
- 8 Mays D, Luta G, Walker LR, et al. Exposure to Peers who smoke moderates the association between sports participation and cigarette smoking behavior among non-white adolescents. *Addict Behav* 2012;37:1114–21.
- 9 Melnick MJ, Miller KE, Sabo DF, et al. Tobacco use among high school athletes and nonathletes: results of the 1997 youth risk behavior survey. *Adolescence* 2001;36:727–47.
- 10 Rodriguez D, Audrain-McGovern J. Team sport participation and smoking: analysis with general growth mixture modeling. *J Pediatr Psychol* 2004;29:299–308.
- 11 Serraino D, Fachin C, Feltrin O, et al. Sport activity and cigarette smoking among young and adult athletes from the northeastern part of Italy. *Eur J Epidemiol* 1988;4:497–502.
- 12 Aaron DJ, Dearwater SR, Anderson R, et al. Physical activity and the initiation of high-risk health behaviors in adolescents. *Med Sci Sports Exerc* 1995;27:1639–45.
- 13 Abrams K, Skolnik N, Diamond JJ. Patterns and correlates of tobacco use among suburban Philadelphia 6th- through 12th-grade students. *Fam Med* 1999;31:128–32.
- 14 Coulson NS, Eiser C, Eiser JR. Diet, smoking and exercise: interrelationships between adolescent health behaviours. *Child Care Health Dev* 1997;23:207–16.
- 15 Diehl K, Thiel A, Zipfel S, et al. How healthy is the behavior of young athletes? A systematic literature review and meta-analyses. *J Sports Sci Med* 2012;11:201–20.
- 16 Lisha NE, Sussman S. Relationship of high school and college sports participation with alcohol, tobacco, and illicit drug use: a review. *Addict Behav* 2010;35:399–407.
- 17 Pate RR, Heath GW, Dowda M, et al. Associations between physical activity and other health behaviors in a representative sample of US adolescents. *Am J Public Health* 1996;86:1577–81.
- 18 Thorlindsson T, Vilhjalmsson R. Factors related to cigarette smoking and alcohol use among adolescents. *Adolescence* 1991;26:399.
- 19 Frazer K, Callinan JE, McHugh J, et al. Legislative smoking bans for reducing harms from secondhand smoke exposure, smoking prevalence and tobacco consumption. *Cochrane Database Syst Rev* 2016;2:CD005992.
- 20 Alesci NL, Forster JL, Blaine T. Smoking visibility, perceived acceptability, and frequency in various locations among youth and adults. *Prev Med* 2003;36:272–81.
- 21 Eisenberg ME, Forster JL. Adolescent smoking behavior: measures of social norms. *Am J Prev Med* 2003;25:122–8.
- 22 Kelly BC, Vuolo M, Frizzell LC, et al. Denormalization, smoke-free air policy, and tobacco use among young adults. *Soc Sci Med* 2018;211:70–7.
- 23 Wakefield M, Forster J. Growing evidence for new benefit of clean indoor air laws: reduced adolescent smoking. *Tob Control* 2005;14:292–3.
- 24 Braun V, Clarke V. Using thematic analysis in psychology. *Qual Res Psychol* 2006;3:77–101.
- 25 Krueger RA, Casey MA. *Focus groups: a practical guide for applied research*. California: Sage Publications, 2009.
- 26 Martens MP, Dams-O'Connor K, Beck NC. A systematic review of college student-athlete drinking: prevalence rates, sport-related factors, and interventions. *J Subst Abuse Treat* 2006;31:305–16.
- 27 Mays D, Gatti ME, Thompson NJ. Sports participation and alcohol use among adolescents: the impact of measurement and other research design elements. *Curr Drug Abuse Rev* 2011;4:98–109.
- 28 Kwan M, Bobko S, Faulkner G, et al. Sport participation and alcohol and illicit drug use in adolescents and young adults: a systematic review of longitudinal studies. *Addict Behav* 2014;39:497–506.
- 29 Park S-H. Smoking and adolescent health. *Korean J Pediatr* 2011;54:401–4.
- 30 Hiscock R, Bauld L, Amos A, et al. Socioeconomic status and smoking: a review. *Ann N Y Acad Sci* 2012;1248:107–23.
- 31 Giles-Corti B, Clarkson JP, Donovan RJ, et al. Creating smoke-free environments in recreational settings. *Health Educ Behav* 2001;28:341–51.
- 32 Weber MD, Bagwell DAS, Fielding JE, et al. Long term compliance with California's smoke-free workplace law among bars and restaurants in Los Angeles County. *Tob Control* 2003;12:269–73.
- 33 Heary C, Hennessy E. Focus groups versus individual interviews with children: a comparison of data. *Ir J Psychol* 2006;27:58–68.
- 34 Norris AE, Aroian KJ, Warren S, et al. Interactive performance and focus groups with adolescents: the power of play. *Res Nurs Health* 2012;35:671–9.
- 35 Horner SD. Using focus group methods with middle school children. *Res Nurs Health* 2000;23:510–7.