

Denormalising smoking in the classroom: does it cause bullying?

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ABSTRACT

Background The Smokefree Class Competition, the largest school-based smoking prevention programme in Europe, aims to create a class climate that denormalises smoking. An analysis was carried out to assess whether it increases bullying or perception of isolation.

Methods A cluster randomised controlled trial was conducted, with two waves of assessment directly before the start and immediately after the end of the prevention programme. Some 3490 students were recruited from 84 secondary schools in Germany, of whom 3123 students (90%) provided data from both waves. Classes from the intervention group (IG) participated in the Smokefree Class Competition, committing themselves to stay smokefree for a period of 6 months, and self-monitoring their smoking status on a weekly basis. Classes that refrained from smoking were eligible for a prize draw. To test the hypotheses that participation in the competition might foster bullying, we measured students' self report of (1) being victimised, (2) engaging in bullying and (3) being isolated.

Results There was a strong association between daily smoking and higher odds of bullying others at baseline (adjusted proportional OR 4.66; 95% CI 3.38 to 6.43). No significant pre–post differences across treatment assignment groups were found on any bullying measure using generalised linear latent and mixed models. For being isolated, the trends suggested that the programme, if anything, fostered lower levels of isolation at follow-up, especially for those who perceived high levels of isolation at baseline.

Conclusion Participation in the intervention had no effect on bullying or perceptions of isolation.

Trial Reg No ISRCTN27091233 in Current Control Trial Register.

INTRODUCTION

Preventing tobacco smoking among young people is a key health priority.¹ Over the last decade, the Smokefree Class Competition (SFC) has become one of the largest smoking-prevention programmes in Europe with over 700 000 participants and 30 000 classrooms in 19 European countries taking part in this competition every year (<http://www.smokefreeclass.info/>). SFC attempts to denormalise smoking and to reinforce non-smoking behaviour by fostering a competition to remain smokefree. Non-smoking classes are rewarded if they succeed. The theoretical basis for the approach is to influence social norms within the peer groups in a way that fosters non-smoking normative values. The general rules are the following: (1) classes make the decision to be a non-smoking class for 6 months (from

autumn to spring); (2) students monitor their smoking status by reporting it publicly and regularly; (3) classes where regular smoking exceeds 10% are dropped from the ability to receive prizes; and (4) classes that refrain from smoking may win a number of attractive prizes, with the main prize being a class trip for the whole class.²

Up to now, four studies, including two randomised trials, have been published on the effectiveness of the competition.^{3–8} More than 12 000 adolescents recruited in Finland, Germany and The Netherlands participated in these studies. Data indicate that short-term effects on smoking uptake in follow-ups ranged from 12 to 24 months. Based on the efficacy data and the cost of the programme, one study supported the cost-effectiveness of this primary prevention approach.⁹

According to the Standards of the Society for Prevention Research, it is desirable to measure potential side-effects or iatrogenic effects of prevention programmes.¹⁰ Most trials of behavioural programmes and policies have not hypothesised negative effects. Some have even employed one-sided analyses¹¹ that preclude the possibility of the programme causing increases in substance use—termed the boomerang effect. Yet these effects are a real possibility. In an extensive review looking for iatrogenic effects of alcohol and drug-prevention programmes, the authors searched bibliographic databases spanning the years 1980–2000; they found evidence of negative programme effects in 17 evaluation studies for which 43 negative outcomes were documented. The most common negative programme-related outcome was increased consumption (boomerang effect), especially for programmes addressing alcohol use. The authors concluded that negative programme effects occurred frequently enough to warrant careful study.¹²

With respect to SFC, one concern is that denormalising smoking in the classroom could create bullying, with children who cause their class to drop out of the competition becoming a subject of stigmatisation or social isolation by the group.^{13 14} This paper offers a test of whether or not SFC participation was associated with bullying by peers or social isolation.

METHODS

Description of the intervention

SFC is carried out under the slogan 'Be Smart—Don't Start' in Germany (<http://www.besmart.info>). The class decides to remain a non-smoking class for a period from November to April (6 months), and a contract is signed,

committing classmates to stay smokefree. A requirement for participation in the competition is that at least 90% of students in class vote in favour of participation. Participating classes monitor their (non-)smoking behaviour on a weekly basis. On a monthly basis, they give feedback to the organisers of the competition if they are still smokefree or have to drop out of the competition if they are not. The definition of smokefree means is that at least 90% of the class students remained smokefree in the previous month. This rule was implemented to ensure that classes, in which the great majority of pupils are non-smokers, are able to participate in the competition and not excluded due to the smoking behaviour of very few individuals. Classes that refrain from smoking may win a number of attractive prizes, the main prize being a class trip.

Design and randomisation

A two-arm two-wave cluster randomised controlled trial was implemented to assess the efficacy of SFC in German schools. After consenting to study participation, schools were assigned randomly to the intervention or the control arm with stratification by type of school. The allocating person was blind to the meaning of group number and the purpose of the study. The intervention classes that chose to participate received the intervention; intervention classes choosing not to participate received 'usual curriculum', which consisted of normal school lessons without any systematic education on smoking; control classes received 'usual curriculum' as well.

Intervention group

One hundred and thirty classes were randomly assigned to the intervention condition and agreed to participate in the study. Sixty-eight classes voted for participation and began the competition in November 2006, of which 42 successfully participated in the competition (intervention group (IG)—successful participation), and 26 dropped out during the course of the competition (IG—unsuccessful participation). Sixty-two classes (48%) declined participation in the competition (IG—no participation).

Control group

Seventy-eight classes were randomly allocated to the untreated control condition.

Data assessment

Data were collected in two waves: prior to the start of the intervention in October 2006 (baseline), and shortly after the end of the intervention in May 2007 (post-test). Data were collected through self-completed anonymous questionnaires, administered by teachers. To permit a linking of individual information on subsequent surveys, each questionnaire was labelled with a seven-digit individual code generated by the student, a procedure that had been tested in previous studies,¹⁵ slightly modified for this trial, using a coding system available on request. Studies of the validity of responses to smoking queries in school settings have shown that students respond honestly if they are assured of the confidentiality of their responses,¹⁶ and the seven-digit code assured confidentiality, because it made the survey anonymous. Directly after completion of the survey, teachers placed the surveys into an envelope and sealed it in front of the class. Finally, students were assured that their individual information would not be seen by parents or school administrators.

Sample

In September 2006, letters were sent to 212 secondary schools in Saxony-Anhalt, a Bundesland (state) of Germany, inviting all

seventh-grade classes to participate in the study. Saxony-Anhalt is a Bundesland with two types of secondary schools. The 'Gymnasium' primarily recruits students with higher academic skills in comparison with the 'Sekundarschule'.

Human subject approval was obtained by the state administration department Saxony-Anhalt (Landesverwaltungsamt Sachsen-Anhalt, Reg.-Nr. 504-50/06). Eighty-seven schools with 223 seventh-grade classes and 4454 students agreed to participate in the study (figure 1). Baseline data were collected from 3490 students. The baseline survey captured 78.4% of students attending the schools; 291 (6.5%) were disqualified because teachers refused to give permission, another 581 (13.0%) had no written parental permission for student participation in the survey, and 92 (2.1%) were absent on the day of the survey.

Two classes with a total of 21 students (0.6% of 3490 students with baseline data) were inadvertently missed at the post-test evaluation. Another 50 students (1.4% of 3490 students with baseline data) gave inconsistent answers on gender and age over time, and were excluded from the analyses. A further 246 students (7.0%) were not successfully matched over the two waves, or were only present at baseline but not at post-test.

Measures

Students' self-report measures included: (1) demographic data (age, gender and nationality); (2) smoking status; and (3) bullying.

Smoking status

Current smoking was assessed by asking 'How often do you smoke at present?' to which respondents could answer 'I don't smoke', 'less than once a month', 'at least once a month, but not weekly', 'at least once a week, but not daily' or 'every day'.

Bullying

Bullying is the assertion of interpersonal power through aggression. It is defined as negative physical or verbal actions that have hostile intent, cause distress to victims, are repeated and involve a power differential between bullies and their victims.¹⁷ The questions on bullying used in the survey were those developed by Olweus,¹⁷ frequently used in international surveys¹⁸ and intervention studies.¹⁹ The questions were preceded by a definition of bullying: 'We say a student is being bullied when another student, or a group of students, say or do nasty and unpleasant things to them. It is also bullying when a student is teased repeatedly in a way they do not like or when they are deliberately left out of things. But it is not bullying when two students of about the same strength or power argue or fight. It is also not bullying when a student is teased in a friendly and playful way.'

Students were asked (1) 'How often have you been bullied in school in the past couple of months?' (being exposed to direct bullying or victimisation); (2) 'How often have you taken part in bullying other students in school in the past couple of months?' (bullying other students), and (3) 'How often does it happen in the past couple of months that other students don't want to be together with you, and you end up being alone?' (being exposed to indirect bullying or victimisation by means of isolation, exclusion from the group). Response options were 'never', 'only about once or twice', 'twice or three times a month', 'about once in a week', and 'several times per week'.

Statistical analyses

In order to test for possible baseline differences between the groups, analyses of variance and χ^2 tests were used. Ordered

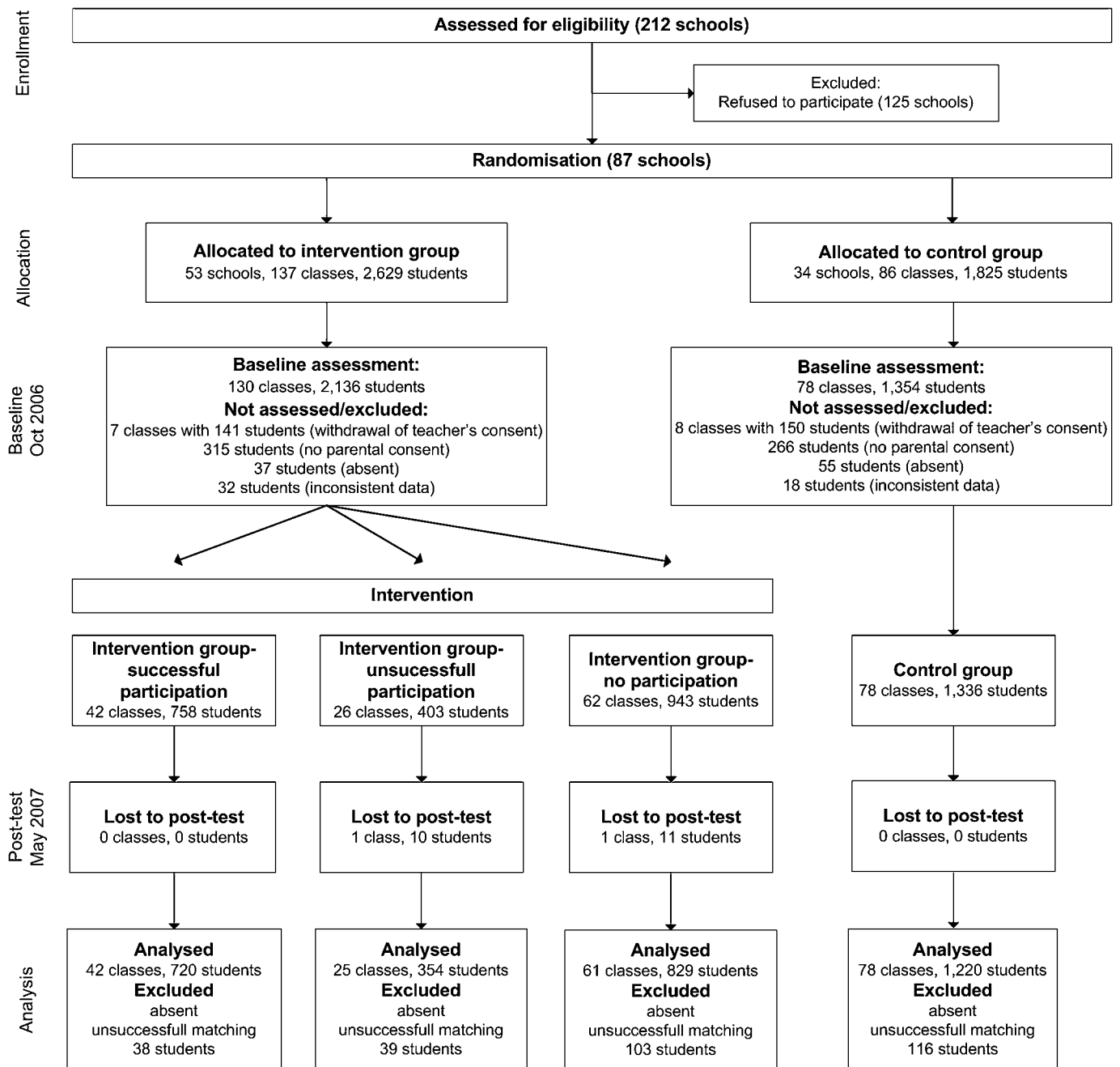


Figure 1 Participant flow chart.

logistic regression analyses were used to determine adjusted proportional or cumulative ORs, and 95% CIs for the association between smoking status and bullying at baseline. As data were grouped at the class level, class was used to generate clustered robust standard errors using the 'cluster' command in Stata's logistic regression platform.

In order to account for the nested structure of the data with observations within classes and classes within schools, generalised linear latent and mixed models were used to determine adjusted proportional or cumulative ORs and 95% CIs for the association between group condition and the post-test outcomes on bullying. Both ordered logistic regression and generalised linear latent and mixed models give cumulative ORs modelling the probability of being in a higher category of bullying given the exposure and controlling for covariates. Analyses were

carried out with STATA (Stata 10.0; Stata Corp, College Station, Texas). All results are reported with two-tailed 95% CIs as measures of statistical significance.

RESULTS

Characteristics of the study sample

The baseline sample consisted of 3440 students, of whom 50% were female. The mean age was 12.63 years (SD=0.71) with a range of 11–16 years. Fifty per cent of the sample (N=1557 students) were students from the 'Sekundarschule'; the other half (N=1566 students) were students from 'Gymnasium'.

Attrition analysis

Overall, retention rate was 91.8% (3123 of 3440 students). Dropout from the study was related to older age, being male,

being non-German citizen, current smoking, being isolated about once a week and going to the 'Sekundarschule'. In randomised trials, attrition can decrease the validity of the results if dropout is differentially related to variables depending on group status. However, no significant dropout by group interaction was detected.

Baseline equivalence between the groups

The four IGs were tested for baseline differences on all variables under study (table 1). There was evidence for inequality between the groups with regard to some items. Students from the IG—no participation were significantly older. Students from the school type 'Sekundarschule' were less frequently represented in

IG—successful participation compared with the other three groups. Similarly, there were higher proportions of non-smokers in the IG—successful participation than the other three groups at baseline. The differences in being bullied were small between groups but still statistically significant, probably because of the large sample size. Having bullied and reports of isolation were significantly more common in the IGs than the control group at baseline.

Association between smoking status and bullying

Table 2 shows results for the association between smoking status and higher level of bullying at baseline. There was no association

Table 1 Characteristics of intervention and control groups in the Smokefree Class Competition in German students (n=3440), 2006–2007

	Intervention group—successful participation N = 758		Intervention group—unsuccessful participation N = 403		Intervention group—no participation N = 943		Control group N = 1336		p Value
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	
Demographics									
Age	12.50	0.66	12.62	0.74	12.73	0.76	12.69	0.73	<0.001
	N	%	N	%	N	%	N	%	P
Gender									
Male	368	48.6	210	52.1	460	48.8	668	50.0	0.639
Female	390	51.5	193	47.9	483	51.2	668	50.0	
Nationality									
German	735	97.6	387	96.8	897	95.6	1279	96.1	0.155
Others	18	2.4	13	3.2	41	4.4	52	3.9	
School type*									
Sekundarschule	389	44.1	314	62.8	657	56.7	846	51.7	<0.001
Gymnasium	493	55.9	186	37.2	501	43.3	789	48.3	
Current smoking									
No smoking	652	86.1	326	80.9	729	77.6	1099	82.3	<0.001
Less than once per month	43	5.7	31	7.7	48	5.1	72	5.4	
At least monthly, less than weekly	21	2.8	6	1.5	40	4.3	39	2.9	
At least weekly, less than daily	18	2.4	13	3.2	33	3.5	56	4.2	
Daily	23	3.0	27	6.7	89	9.5	69	5.2	
Bullying									
Has been bullied during last few months									
Never	342	45.5	167	41.9	399	42.9	654	49.8	<0.05
Altogether once or twice	253	33.6	139	34.8	348	37.4	441	33.6	
Twice or three times per month	63	8.4	32	8.0	66	7.1	81	6.2	
About once per week	38	5.1	20	5.0	43	4.6	52	4.0	
Several times per week	56	7.5	41	10.3	74	8.0	86	6.5	
Has bullied during last few months									
Never	346	46.2	167	41.9	393	42.4	654	49.4	<0.01
Altogether once or twice	259	34.6	141	34.3	324	35.0	429	32.4	
Twice or three times per month	60	8.0	35	8.8	82	8.9	116	8.8	
About once per week	40	5.3	36	9.0	70	7.6	50	3.8	
Several times per week	44	5.9	20	5.0	58	6.3	76	5.7	
Has been isolated during last few months									
Never	609	81.4	326	80.9	782	84.0	1124	84.8	<0.01
Altogether once or twice	91	12.2	57	14.1	92	9.9	152	11.5	
Twice or three times per month	22	2.9	9	2.2	27	2.9	14	1.1	
About once per week	12	1.6	1	0.3	19	2.0	15	1.1	
Several times per week	14	1.9	10	2.5	11	1.2	21	1.6	

*The 'Gymnasium' primarily recruits students with higher academic skills in comparison with the 'Sekundarschule'.

Table 2 Association between smoking status and bullying in German students (n=3440) at baseline October 2006

Current smoking	Frequency of bullying in the last couple of months					Adjusted OR*	95% CI
	Never N (%)	Once or twice N (%)	Twice or three times per month N (%)	Once a week N (%)	Several times per week N (%)		
Has been bullied							
No smoking	1296 (47)	963 (35)	195 (7)	114 (4)	203 (7)	1.00	
Less than once a month	71 (37)	86 (44)	15 (8)	12 (6)	9 (5)	1.23	0.94–1.61
At least once a month, but not weekly	47 (45)	30 (29)	9 (9)	8 (8)	9 (9)	1.17	0.78–1.74
At least once a week, but not daily	56 (47)	39 (32)	8 (7)	5 (4)	12 (10)	0.94	0.61–1.43
Every day	89 (44)	62 (31)	14 (7)	13 (6)	24 (12)	1.09	0.78–1.51
Has bullied							
No smoking	1411 (51)	936 (34)	195 (7)	114 (4)	114 (4)	1.00	
Less than once a month	35 (18)	82 (42)	38 (20)	22 (11)	15 (8)	3.74	2.87–4.97
At least once a month, but not weekly	30 (28)	33 (31)	14 (13)	12 (12)	17 (16)	3.39	2.21–5.20
At least once a week, but not daily	37 (31)	39 (33)	17 (14)	17 (14)	9 (8)	2.53	1.76–3.63
Every day	46 (22)	60 (29)	29 (14)	30 (15)	42 (20)	4.66	3.38–6.43
Has been isolated							
No smoking	2306 (83)	324 (12)	62 (2)	38 (1)	46 (2)	1.00	
Less than once a month	163 (85)	24 (12)	1 (1)	1 (1)	4 (1)	0.87	0.59–1.29
At least once a month, but not weekly	85 (80)	13 (12)	4 (4)	2 (2)	2 (2)	1.27	0.76–2.10
At least once a week, but not daily	105 (87)	10 (8)	1 (1)	3 (3)	1 (1)	0.69	0.40–1.19
Every day	177 (86)	20 (10)	4 (2)	3 (1)	3 (1)	0.79	0.51–1.22

*Proportional OR adjusted for age, sex, nationality, type of school and group condition (intervention group—successful participation, intervention group—unsuccessful participation, intervention group—no participation, control group).

between smoking status and being victimised or being isolated. However, compared with non-smokers, all classes of experimental smokers were significantly more likely to be involved in bullying other students (ORs vary between 2.53 and 4.66).

Intervention effects on bullying

The crude association between level of bullying at post-test as a function of intervention status and baseline level of bullying was explored graphically. In no case was the mean level of bullying higher for successful intervention classes compared with the other intervention categories. The largest divergence between results among groups was seen for isolation (figure 2). For adolescents in the two highest categories of isolation at baseline, post-test means were lowest for the IG—successful participation group.

The multivariate associations between intervention status and changes in bullying over time are presented in table 3. When compared with control classrooms on all three dependent variables—being victimised, active bullying or being isolated—the adjusted ORs indicated no significant differences at post-test for any of the IGs. The IG—no participation group had a higher odds

of active bullying that almost reached statistical significance (adjusted proportional OR 1.19 95% CI 0.98 to 1.45. There is a tendency towards lower odds of exclusion from the group in those classes that participated successfully in the competition (adjusted proportional OR 0.77; 95% CI 0.59 to 1.00) that was almost statistically significant.

DISCUSSION

This randomised trial provides longitudinal evidence that a school-based tobacco prevention programme that aims to denormalise smoking in the classroom does not increase perceptions of bullying and isolation by peers. This finding strengthens the scientific rigour behind a recent Swiss cross-sectional study that reached the same conclusion about bullying and the SFC.²⁰ This study was cross-sectional and compared classes that chose to participate with classes that chose not to, so it was not clear whether the results were attributable to the competition itself or to selection bias. The finding that SFC does not result in bullying is relevant because of the large size of the competition, involving tens of thousands of students each year. This study effectively addresses criticisms that the SFC has

Figure 2 Mean level of isolation at post-test as a function of level of isolation at baseline and intervention status.

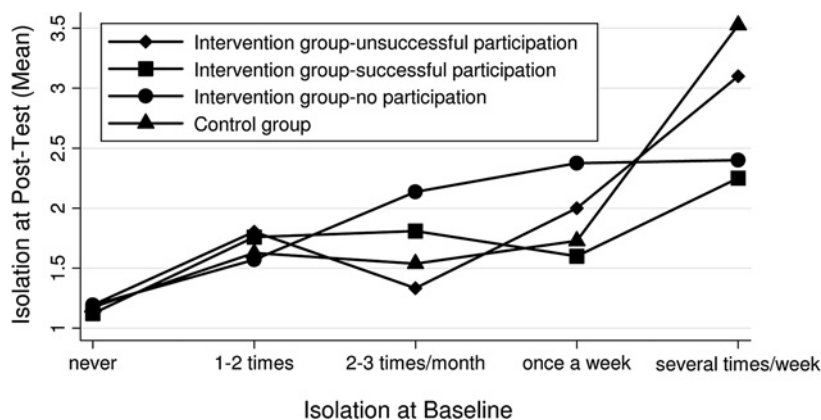


Table 3 Bullying at post-test May 2007 in German students depending on participation in the Smokefree Class Competition

	Frequency of bullying in the last couple of months					Adjusted OR	95% CI
	Never N (%)	Once or twice N (%)	Twice or three times per month N (%)	Once a week N (%)	Several times per week N (%)		
Has been bullied							
Group							
Control group	635 (47)	467 (35)	84 (6)	72 (5)	93 (7)	1.00	
Intervention group—no participation	403 (44)	313 (34)	74 (8)	77 (8)	53 (6)	0.95*	0.77–1.18
Intervention group—successful participation	337 (44)	272 (36)	51 (7)	52 (7)	43 (6)	0.93*	0.74–1.15
Intervention group—unsuccessful participation	168 (43)	130 (33)	31 (8)	18 (5)	41 (11)	0.96*	0.73–1.27
Has bullied							
Group							
Control group	575 (43)	466 (35)	141 (10)	82 (6)	87 (6)	1.00	
Intervention group—no participation	327 (35)	337 (36)	111 (12)	61 (7)	90 (10)	1.19†	0.98–1.45
Intervention group—successful participation	316 (42)	283 (37)	59 (8)	47 (6)	49 (7)	1.06†	0.86–1.31
Intervention group—unsuccessful participation	155 (39)	137 (35)	47 (12)	24 (7)	25 (7)	1.00†	0.77–1.30
Has been isolated							
Group							
Control group	1114 (82)	174 (13)	31 (2)	11 (1)	23 (2)	1.00	
Intervention group—no participation	758 (81)	110 (12)	26 (3)	15 (2)	18 (2)	1.02‡	0.80–1.30
Intervention group—successful participation	633 (83)	83 (11)	21 (3)	7 (1)	12 (2)	0.77‡	0.59–1.00
Intervention group—unsuccessful participation	321 (82)	42 (11)	6 (2)	6 (2)	14 (3)	0.98‡	0.71–1.36

*Proportional ORs adjusted for age, sex, nationality, type of school, smoking status and having been bullied at baseline.

†Proportional ORs adjusted for age, sex, nationality, type of school, smoking status and having bullied at baseline.

‡Proportional ORs adjusted for age, sex, nationality, type of school, smoking status and having been isolated at baseline.

potential to cause greater social isolation among adolescent smokers.¹³ We concur that the evaluation of iatrogenic effects of a prevention programme should be a precondition for the larger dissemination of any programme, especially widely disseminated programmes. This study suggests that concerns about bullying should not preclude further dissemination of SFC.

As documented in other studies, bullying does occur in classroom settings. In this sample, some 8% of the students reported of being victimised several times a week. Smoking status was not related to being bullied or isolated; instead, it was related to a higher likelihood of engaging in bullying behaviour, a finding that has been reported by other research groups,^{21–23} suggesting that this was not a chance occurrence. Further research may be warranted to determine the reasons that adolescent smokers tend to engage in bullying and perhaps target them for interventions to address this issue.

There are many strengths to the study, prospective design, randomisation by classroom, follow-up of a control group in addition to all the IG categories and direct assessment of a hypothesised side effect. There are also limitations. First, self-reports could be a source of distortion; we suggest that it is not

very likely that biases in self-reported bullying were treatment-group-specific. Second, we did not assess whether there was any bullying due to the smoking of a student but assessed bullying on a very general level. Hence, we do not know whether group effects might emerge by breaking the non-smoking contract. We suggest that any large effects should have been picked up by the general measure.

From a more general point of view, one could ask whether social denormalisation is something bad in itself. Clearly, social pressure that leads to stigmatisation is bad, as demonstrated in the dysfunction with which some societies have approached drug addicts and needle-exchange programmes, or programmes to foster safe sex in gay communities to prevent HIV/AIDS.²⁴ But social sanctions can also be a healthy ingredient of social change.²⁵ As an example, many former smokers identify the social unacceptability of smoking as the main reason they quit.²⁶ When the outcome is particularly adverse, as it is with smoking, it has become acceptable to foster a certain level of social denormalisation as an incentive for people to quit.²⁷ Programmes that teach children how to apply pressure to individuals that depart from the norm (by taking up smoking) without fostering stigmatisation or discrimination may be an important strategy for prevention.

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Competing interests RH, BI, MM and KM received funding for implementation and evaluation of the prevention programme at the same time.

Ethics approval This study was conducted with the approval of the Landesverwaltungsamt Sachsen-Anhalt, Reg. -Nr. 504-50/06.

Implications for policy and practice

Evidence-based prevention programmes which are ready for larger dissemination should be tested not only for efficacy and effectiveness but also for safety. The Smokefree Class Competition fosters a competition to denormalise smoking in the classroom, a programme that could have the adverse effect of bullying and social isolation of smokers. Study results indicate that participation in the Smokefree Class Competition had no such effects. At all points in the study, smokers were more likely to be bullies but were not at higher risk for being bullied.

Patient consent Obtained.

Provenance and peer review Not commissioned; externally peer reviewed.

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