The relationship between subjective wellbeing, low income and substance use among schoolchildren in the north west of England: a cross-sectional study

Siobhan Farmer[1], Barbara Hanratty[2]

[1]Cheshire and Merseyside Health Protection Unit, 5th Floor, Rail House, Lord Nelson Street, Liverpool L1 1JF, UK
[2] Department of Public Health and Policy, University of Liverpool, Liverpool L69 3GB, UK
 Address correspondence to Siobhan Farmer, E-mail: siobhan.farmer@nhs.net; siobhan.farmer@hpa.org.uk

ABSTRACT

Background The consumption of tobacco, alcohol and illegal drugs by young people is a public health concern. This study aimed to explore the associations between subjective wellbeing, living in a low-income household and substance use by schoolchildren.

Methods Data were analysed from a nationally representative cross-sectional survey of schoolchildren in England (Tellus4, 2009). Participants were 3903 children aged 10 and 15 years from two local authorities in the North West. Eligibility for free school meals provided a proxy for living in a low-income household. Multiple logistic regression was conducted with the main outcome measure, a composite indicator of self-reported regular substance use.

Results More boys than girls had experimented with drugs or alcohol, but in the fourth year of secondary education, girls were significantly more likely than boys to have been drunk ($P \leq 0.001$). In the multivariate analysis, older age was the most important factor associated with the consumption of substances. Living in a low-income household was associated with substance use, adjusting for age and subjective wellbeing (adj. OR = 1.78, 95% CI = 1.36–2.34). Respondents who reported being happy (adj. OR = 0.67, 95% CI = 0.52–0.86) or able to communicate with their family (adj. OR = 0.51, 95% CI = 0.39–0.65), were less likely to be regular users.

Conclusions Interventions to prevent regular substance use should be carefully targeted by age. Policies aimed at social determinants may be an important adjunct to individual-level interventions to reduce some inequalities in health associated with substance misuse.

Keywords alcohol drinking, children and adolescents, smoking, socioeconomic factors, street drugs Tellus4, wellbeing

Introduction

The misuse of tobacco, alcohol and illegal drugs among young people is a public health concern in the UK. The short- and long-term risks to health are well known and range from accidental injuries, violence and sexual ill-health to increased rates of chronic conditions and premature mortality. Substance misuse also has social consequences, with higher incidence of truancy, exclusion from school and homelessness.[1–3] Smoking tobacco is associated with an increased use of other substances and overall substance use in childhood is associated with greater likelihood of substance misuse in adulthood.[1]

A range of policies have been directed at reducing substance use among English children.[4–8] Despite some fall in usage over recent years, the number of children taking substances remains substantial.[9] In 2009, 180 000 of the 3.1 million children aged 11–15 years in England smoked tobacco regularly, 540 000 had consumed alcohol in the previous week and 250 000 had taken drugs in the previous month.[9] Three in 10 (29%) pupils reported that they had tried smoking, just under a quarter (22%) had tried illegal drugs at least once and over half (51%) had tried at least one alcoholic drink.

Siobhan Farmer, Public Health Specialty Registrar (Mersey Deanery)
Barbara Hanratty, Clinical Senior Lecturer in Population and Community Health

Action to decrease the numbers of children living in poverty has been suggested as a means of decreasing the risk of drug use.[1] In one review of research from Western Europe, low socioeconomic status measured in different ways was shown to be associated with smoking, but not alcohol or cannabis use.[10] This finding also emerged from research with a representative sample of >6000 English schoolchildren aged 11–15 years: children from better off households were twice as likely to drink alcohol as their less affluent peers.[11]

Poverty is associated with poor wellbeing amongst children.[12] The UK Advisory Council on the Misuse of Drugs has suggested that tackling poverty will increase happiness, meaning that fewer children will use substances.[1] Happiness is just one of a suite of indicators used within the broad concept of subjective wellbeing, along with self-esteem, self-efficacy, happiness and life satisfaction.[13] Research on the relationship between indicators of subjective wellbeing and substance use has produced conflicting results, which may reflect the lack of consensus on how wellbeing should be defined. Studies with children in England have found low subjective wellbeing (measured by happiness at home, ability to talk to parents and perception of school) and low self-esteem to be associated with increased risk of consuming alcohol[11,14,15] smoking and substance use.[14,15] Children with positive measures of wellbeing were less likely to drink alcohol in a study from the north west of England.[16] In contrast, analyses of similar data from Irish schoolchildren[17] and young people in the British Household Panel Survey[18] found no association between self-esteem and substance use. A study of 1000 Scottish children found that those with higher self-esteem tended to engage in more substance use than children of lower self-esteem.[19] Self-efficacy, a measure of a child's belief that they can act in a particular way, was not correlated with substance use in UK studies.[18,20–22]

In England, local authority performance in preventing substance misuse among young people and promoting emotional health and wellbeing was measured using national indicators (NIs).[23,24] Data used to construct the indicators were taken from Tellus, a country-wide, online, anonymous, school-based cross-sectional survey for children aged 10 and 11 (Year 6), 12 and 13 (Year 8) and 14 and 15 (Year 10; Table 1). The surveys collected information on pupils' opinions of school and their local area, along with health-related behaviours including the use of alcohol and tobacco, and in Years 8 and 10, illegal drugs.[25] In the most recent Tellus survey (Tellus4), some areas found that children with high levels of substance use (measured by NI 115) also had high emotional wellbeing (measured by NI 50).[26,27] However, there has been no published analysis using Tellus4 data at the level of the individual to explore whether children who misuse substances have better wellbeing than their peers, taking their sociodemographic context into account.

In this study, we aimed to explore the relationship between substance use, subjective wellbeing and socioeconomic status amongst 10–15-year pupils attending schools in two local authorities in the North West of England. There is a paucity of primary research that examines the interrelation of these three issues and this analysis begins to address that gap in our understanding of the influences on substance use by young people.

Methods

Tellus survey

The methodology for the Tellus survey is reported elsewhere (and a summary available in the Supplementary data, Appendix S1).[27] The survey used a stratified sampling approach to select primary and secondary schools from every English local authority. In the most recent 2009 survey (Tellus4), 3699 of 10 845 (34%) of schools took part, across 151 of 152 local authorities. Children in participating schools completed the survey online, at school. Demographic data were collecting, including year group, gender, ethnicity, eligibility for free school meals, an indicator of special needs and disability status. The questionnaire contained 33 questions on a range of health, school and community issues.[27]

Local authorities received a data set (SPSS data file) containing individual responses from children in their schools. Certain data, such as school and postcode, were suppressed to prevent the comparison of schools at local authority level. In addition, where a child possessed a specific combination of demographic characteristics (for example, ethnicity, gender, special needs and age) which made them potentially identifiable, these data were suppressed.

Sample and data acquisition

The study reported here was prompted by a national newspaper article[28] that highlighted the levels of substance use in one local authority that were higher than the England average. This local authority and its geographical neighbour were selected for inclusion in this study, as they were coterminous with the Primary Care Trust where one of the authors was employed. Appropriate permission was obtained to access the raw data files from the most recent 2009 Tellus4 survey. Variables used in analysis are listed in Table 1.

Table 1 Tellus4 variables used in analysis

Variable	Question no.	Options	Notes
Gender	Q1	Male Female	Data suppressed if child identifiable
Year group	Q2	Year 6 (aged 10 or 11 years) Year 8 (aged 12 or 13 years) Year 10 (aged 14 or 15 years)	Year group calculated by NFER from answer to question about age
Eligibility for free school meals	Q5	Yes No I don't know	In this study, 'I don't know' is recoded as missing. Data suppressed if child identifiable
Smoking status	Q31	I have never smoked Tried once Used to smoke Sometimes smoke Smoke 1–6 per week Smoke >6 per week I don't want to say'	Children who 'don't want to say' were excluded from the analysis
Ever tried alcohol	30a	Yes No	These two questions had the same answer options. Children who 'don't want to say' were excluded from the analysis
Ever taken drugs	32a	I don't want to say	
Times drunk (alcohol intoxication) in last 4 weeks	30b	None/never	These questions had the same answer options. Children who 'don't want to say' or 'don't remember' (and never been drunk with alcohol) were excluded from both variables in this study. 'Other drugs' includes ecstasy, heroin, crack, speed, cocaine, magic mushrooms and LSD
		Once Twice Three times	
Times taken cannabis in last 4 weeks	32b	Don't remember	
Times taken solvents in last 4 weeks	32c	Don't want to say	
Times taken other drugs in last 4 weeks	32d	Never been drunk (alcohol Q30b only)	
Happy with life	Q16a	True	For these questions, children answering 'true' were recoded as being 'yes' happy or 'yes' one or more good friends. All other children were coded as 'No'
Has one or more good friends	Q16b	False	
Can talk to mum or dad	Q16c	Neither true nor false	
Can talk to friends	Q16d	I don't know	
Can talk to other adult (not parent)	Q16e		
NI 50 Emotional health and wellbeing (national indicator)	Composite variable calculated from using Department for Children Schools and Families statistical release. Includes children who have one or more good friends and answer 'true' to at least two other questions from 'I can talk to my parents, 'I can talk to my friends', 'I can talk to an adult who is not my parent'		
NI 115 Substance user (NI)	Composite variable calculated from using Department for Children Schools and Families statistical release. Includes children in Year 6 who have been drunk more than twice in last 4 weeks, and children in Years 8 and 10 who have been drunk more than twice, at least drunk once and taken drugs once or taken drugs at least twice in the last 4 weeks		
'Regular user of any substance'	Composite variable calculated from calculated using Department for Children Schools and Families statistical release. Includes children in Year 6 drunk more than twice in last 4 weeks, and Years 8 and 10, and all children who smoke more than one cigarette per week, but are not NI 115 'regular users'		

Socioeconomic status and demographic variables

We used demographic variables with low levels of missing data: year group (0% unavailable), gender (0.9% unavailable, 36 children) and eligibility for free school meals (2.6% unavailable, 100 children). Self-reported eligibility for free school meals was used as a proxy indicator for low income, as no other measures of socioeconomic status were available.

Subjective wellbeing variables

There was no specific measure of 'subjective wellbeing' nor were there variables identified in the literature review such as self-esteem or self-efficacy. Therefore, we reproduced the NI 50 calculation (Table 1 and explained in detail in the Supplementary data, Appendix S1) to identify children with 'emotional wellbeing' and analysed responses to each of the questions separately ('Has one or more good friends'; 'I can talk to my parents; 'I can talk to my friends' and 'I can talk to an adult who is not my parent'). We also included the survey question 'I feel happy about life' as this is a commonly used indicator of subjective wellbeing.[26]

Substance use variables

Data were available on the frequency of smoking tobacco, drinking alcohol and use of illicit substances. Published methodology (see Supplementary data, Appendix S1) was used to calculate the NI 115 indicator which identifies children who are regular users of alcohol and/or drugs in Year 8 and 10 (ages 12–13 and 14–15) and alcohol only in Year 6 (age 10–11).[26]

Regular smoking, defined as smoking more than one cigarette every week, is harmful to health and may be a 'gateway' to use of other drugs particularly in early adolescence.[1,9,29,30] Furthermore, tobacco use at any age has been shown to have a greater overlap with illegal drug use than it does with drinking alcohol, or than drinking alcohol does with drug use.[1] As the sample size did not allow analysis of individual illegal drugs, we grouped children who smoked more than one cigarette per week ('regular smokers') along with those regularly using alcohol or illegal drugs (as defined by the NI 115 indicator) to create our main outcome variable indicating 'regular user of any substance'. This means that those children who do not use alcohol and/or drugs regularly but who smoke will also be classified as 'regular user of any substance' (Table 1)."

Analysis

Chi-squared tests were used to explore associations between all variables and the 'regular user of any substance' variable. We completed univariate logistic regression tests for each variable and then combined significantly associated variables into a multivariate logistic regression model, using SPSS v17.0.

Results

Demographic characteristics

The Tellus4 data set from the two local authorities contained information from 3903 children, representing 1.2% of the national sample. Approximately one-third of all children in specified year groups, registered for school in the study area, were surveyed. The combined data set contained an approximately equal distribution of pupils across all year groups: 1354 (34.7%) in Year 6, 1266 (32.4%) in Year 8 and 1283 (32.9%) in Year 10. The year groups contained similar numbers of male and female participants ($\chi^2 = 1.332$, d.f. = 2, $P = 0.514$).

Variations in substance use were seen by gender. Across all respondents, 23.5% ($n = 1769$) of girls reported ever trying smoking, compared with 20.5% ($n = 1769$) of boys ($\chi^2 = 4.525$, $P = 0.033$), although there was no significant difference ($P = 0.099$) between the 44.2% ($n = 65$) of boys and the 55.8% ($n = 82$) who smoke more than one cigarette per week. Boys were statistically significantly more likely to have tried both alcohol and drugs than girls. Four per cent more boys than girls reported ever having a full alcoholic drink (49.8%, $n = 1848$, compared with 45.6%, $n = 1962$, $\chi^2 = 6.755$, $P = 0.009$) and nearly twice as many boys reported experimentation with illicit substances (9.9%, $n = 1195$ compared with 5.5%, $n = 1261$, $\chi^2 = 16.485$, $P = <0.001$).

The general trends were consistent across year groups with the exception of alcohol use in Year 10, where 3% more girls than boys tried alcohol (80.9%, $n = 591$ compared with 77.7%, $n = 621$, $P = 0.165$). Secondly, girls in Year 10 were significantly more likely to have been drunk in the preceding 4 weeks than boys ($\chi^2 = 16.456$, $P = <0.001$), with almost twice as many (19.1% compared with 11.5%) reporting being drunk at least three times (Fig. 1).

Statistically significant differences between boys and girls were observed for some aspects of subjective wellbeing. Three per cent more girls felt less able to talk to their parents than boys ($\chi^2 = 4.472$, $P = 0.034$) and 7% more reported being unhappy ($\chi^2 = 23.297$, $P \leq 0.001$). Girls were more able to talk to their friends than boys (76.8%, $n = 1850$, compared with 63.5%, $n = 1883$). This is significant across all year groups at the 99.9% level. Amongst all participants, there was a significantly higher number of girls (65.3%, $n = 1833$) than boys (61.1%, $n = 1851$) who had
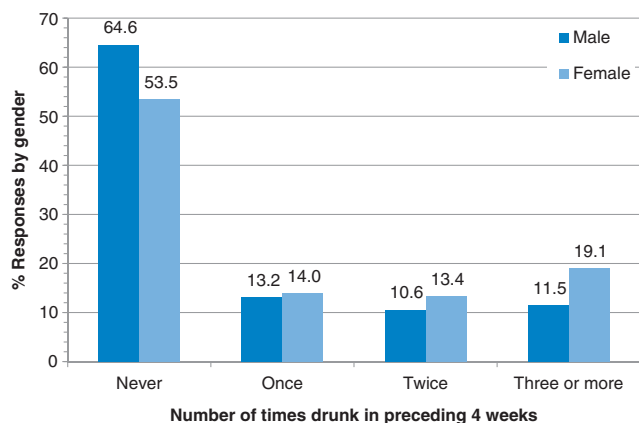
Fig. 1 Self-reported frequency of being drunk by gender among Year 10 respondents.

'emotional wellbeing' using the composite NI50 emotional wellbeing indicator ($\chi^2 = 6.987$, d.f. $= 1$, $P = 0.008$), although the significant association was not maintained across all year groups.

Associations between subjective wellbeing and eligibility for free school meals

In univariate analyses, children eligible for free school meals were significantly more likely to report being unhappy than children who were not eligible (33.2%, $n = 252$ compared with 27.2%, $n = 795$, $P \leq 0.001$; Table 2). They also felt less able to talk to their friends (66.4%, $n = 498$ compared with 71.3%, $n = 2054$, $P = 0.008$) or parents if worried (64.6%, $n = 485$ compared with 66.9%, $n = 2022$, $P = 0.005$), and less likely to say that they have one or more good friends. Ability to talk to friends was significantly lower in children eligible for free school meals compared with those who were ineligible, across all three-year groups. When stratified by age, children in Years 8 and 10 who were eligible for free school meals remained significantly more likely to report feeling unhappy than children who were not eligible. Differences between the eligible and non-eligible children in being able to talk to friends were significant only in Year 8.

Associations between substance use and eligibility for free school meals

Approximately one in five children (18.2%) were eligible for free school meals. This was associated with an increased frequency of smoking and drug use, but not with alcohol use. Just under one-third (31.6%) of children eligible for free school meals reported smoking at least once, compared with only one-fifth (19.8%) of children who were not eligible ($\chi^2 = 45.801$, d.f. $= 1$, $P \leq 0.001$; Table 3). This association

remained statistically significant at the 99.9% level when the sample was stratified by age. For all respondents, 25.9% of children eligible for free school meals who reported drinking alcohol, were drunk once or more often in the last 4 weeks, compared with 19.4% of their peers ($\chi^2 = 13.851$, $P = 0.003$). The proportion of children in Years 8 and 10 eligible for free school meals who had ever tried drugs was approximately twice as high as the proportion of children not eligible for free school meals who had ever tried drugs (12.5% compared with 6.6% ($\chi^2 = 19.481$, $P \leq 0.001$). This association remained when stratified by age in both Year 8 ($\chi^2 = 6.979$, $P = 0.008$) and Year 10 ($\chi^2 = 20.993$, $P \leq 0.001$).

Associations between substance use and subjective wellbeing

Substance misuse and subjective wellbeing variables were associated in univariate analyses. Children who reported feeling happy were less likely to have ever tried smoking (18.4%, $n = 2582$), used alcohol (44.8%, $n = 2683$) or drugs (6.4%, $n = 1695$) than their less happy peers (respectively, 30.6%, $n = 991$; 55.3%, $n = 1058$; and 10.6%, $n = 747$). Three-quarters of the participants who reported feeling happy (77.4%, $n = 2682$) said they could talk to their parents, whereas only half (47.1%, $n = 1074$) of those who were less happy felt they could do so. The pattern of association between substance use and 'emotional wellbeing' using the NI 50 indicator is similar to that of happiness, although there is no significant difference in the use of alcohol between children classified with high emotional health (47.6%, $n = 2304$) and those who were not (48.5%, $n = 1337$).

Smoking status was associated with other substance use, when it was measured by the NI 115 substance use indicator, ($\chi^2 = 561.089$, $P \leq 0.001$). Only 30.2% ($n = 361$) 'NI 115 users' of alcohol and/or drugs had never smoked compared with 84.1% ($n = 3211$) of those children who did not regularly use substances. The number of children smoking more than one cigarette a week was also significantly higher among regular users of substances than children who do not use substances regularly, measured by the NI 115 indicator (NI 115 excludes smoking; 24.9%, $n = 90$, compared with 1.3%, $n = 42$, $\chi^2 = 508.857$, $P \leq 0.001$). Smoking more than one cigarette a week compared with smoking less than this, was also negatively associated with happiness and being able to talk to parents (both significant at $P \leq 0.001$). This pattern was the same for the NI 115 indicator for substance users: 39.3% ($n = 382$) of children designated as substance users by the NI 115 do not agree

Table 2 Subjective wellbeing among all respondents by free school meals eligibility

	All children, n (%)	Free school meal eligibility		P value (χ^2)
		Eligible, n (%)	Not eligible, n (%)	
Happy with life				
No	1047 (28.5)	252 (33.2)	795 (27.2)	<0.001
Yes	2632 (71.5)	508 (66.8)	2124 (72.8)	
Total	3679	760	2919	
Has one or more good friends				
No	201 (5.5)	69 (9.2)	132 (4.6)	<0.001
Yes	3448 (94.5)	683 (90.8)	2765 (95.4)	
Total	3649	752	2897	
Can talk to parents				
No	1135 (31.2)	266 (35.4)	869 (30.1)	0.005
Yes	2507 (68.8)	485 (64.6)	2022 (69.9)	
Total	3642	751	2891	
Can talk to friends				
No	1077 (29.7)	252 (33.6)	825 (28.7)	0.008
Yes	2552 (70.3)	498 (66.4)	2054 (71.3)	
Total	3629	750	2879	
Can talk to adult not mum or dad				
No	1983 (54.8)	396 (53.1)	1587 (55.2)	0.296
Yes	1637 (45.2)	350 (46.9)	1287 (44.8)	
Total	3620	746	2874	
Emotional health and wellbeing NI 50[a]				
Low	1314 (36.7)	292 (39.7)	1022 (35.9)	0.058
High	2269 (63.3)	444 (60.3)	1825 (64.1)	
Total	3583	736	2847	

Percentages may not total 100% due to rounding. Where *n* varies, it is due to excluded or missing cases.

[a]NI 50 was calculated from published methodology. It includes children who have one or more good friends and answer 'true' to at least two other questions from 'I can talk to my parents, 'I can talk to my friends' and 'I can talk to an adult who is not my parent'

that they are happy with life, compared with 26.9% ($n = 3314$) of non-NI 115 substance user children. NI 115 users were significantly more likely to talk to their friends (77.6%, $n = 380$, $P = 0.026$) than the non-NI 115 children (69.3%, $n = 3625$). If smoking more than once per week and the NI 115 indicator formula are combined to the new 'regular user of any substance' variable, the associations were the same.

The 'regular user of any substance' variable included all 361 respondents classified as substance users from the NI 115 formula and an extra 42 young people who had not been drunk or taken drugs recently, but who smoked more than one cigarette a week (regular smokers). Of the 361 NI 115 designated substance users in the sample, 109 (30.2%) had never tried smoking, and a further 131 (36.2%) only tried it once or didn't smoke any more. Variables that were significantly associated with the 'regular user of any substance' variable in univariate analysis were included in the multivariate logistic regression (Table 4).

Factors associated with regular use of any substance in multivariate analysis

Table 4 shows the results of the multivariate logistic regression. Children who reported feeling happy were one-third less likely to use substances compared with children who said they were not happy with life (adj. OR = 0.668, 95% CI = 0.518–0.861). Children who said they could talk to their parents when they were worried were half as likely to use substances as children who felt unable to discuss worries with parents (adj. OR = 0.507, 95% CI = 0.394–0.651). Children who said they had better relationships with their friends were nearly 40% more likely to use substances than those who felt they had poor friendships (adj. OR = 1.373, 95% CI = 1.037–1.818). Children who were eligible for free school meals in this sample were twice as likely to use substances compared with children who did not receive free school meals (adj. OR = 1.781, 95% CI = 1.356–2.339). Age was the most significant predictor of substance

Table 3 Self-reported substance use among all respondents by free school meals eligibility

	All children, n (%)	Free school meal eligibility		P value (χ^2 test)
		Eligible, n (%)	Not eligible, n (%)	
Smoking				
Never smoked	2728 (77.8)	482 (68.4)	2246 (80.2)	<0.001
Tried once	397 (11.3)	107 (15.2)	290 (10.4)	
Used to smoke	179 (5.1)	41 (5.8)	138 (4.9)	
Sometimes smoke	57 (1.6)	16 (2.3)	41 (1.5)	
Smoke 1–6 per week	26 (0.7)	9 (1.3)	17 (0.6)	
Smoke >6 per week	118 (3.4)	50 (7.1)	68 (2.4)	
Total	3505	705	2800	
Ever tried alcohol				
No	1903 (51.8)	377 (49.5)	1526 (52.4)	0.145
Yes	1769 (48.2)	385 (50.5)	1384 (47.6)	
Total	3672	762	2910	
Drunk: last 4 weeks				
Never	2391 (79.3)	463 (74.1)	1928 (80.6)	0.003
Once	255 (8.5)	62 (9.9)	193 (8.1)	
Twice	176 (5.8)	45 (7.2)	131 (5.5)	
Three or more	195 (6.5)	55 (8.8)	140 (5.9)	
Total	3017	625	2392	
Ever taken drugs				
No	2214 (92.2)	433 (87.5)	1781 (93.4)	<0.001
Yes	187 (7.8)	62 (12.5)	125 (6.6)	
Total	2401	495	1906	
Cannabis: last 4 weeks				
Never	2212 (96.2)	428 (93.2)	1784 (97.0)	0.001
Once	29 (1.3)	8 (1.7)	21 (1.1)	
Twice	13 (0.6)	6 (1.3)	7 (0.4)	
Three or more	45 (2.0)	17 (3.7)	28 (1.5)	
Total	2299	459	1840	
Solvents: last 4 weeks				
Never	2250 (98.3)	440 (97.3)	1810 (98.6)	—
Once	9 (0.4)	3 (0.7)	6 (0.3)	
Twice	4 (0.2)	0 (0.0)	4 (0.2)	
Three or more	25 (1.1)	9 (2.0)	16 (0.9)	
Total	2288	452	1836	
Other drugs: last 4 weeks				
Never	2238 (97.9)	431 (95.8)	1807 (98.4)	—
Once	16 (0.7)	8 (1.8)	8 (0.4)	
Twice	6 (0.3)	1 (0.2)	5 (0.3)	
Three or more	26 (1.1)	10 (2.2)	16 (0.9)	
Total	2286	450	1836	
Regular user (NI 115)[a]				
No	3244 (89.5)	645 (86.7)	2599 (90.2)	0.005
Yes	380 (10.5)	99 (13.3)	281 (9.8)	
Total	3624	744	2880	

Table 3 Continued

| | All children, n (%) | Free school meal eligibility | | P value (χ^2 test) |
		Eligible, n (%)	Not eligible, n (%)	
Regular user of any substance[b]				
No	3056 (88.6)	581 (84.4)	2475 (89.6)	0.000
Yes	394 (11.4)	107 (15.6)	287 (10.4)	
Total	3450	688	2762	

Percentages may not total 100% due to rounding. Where *n* varies, it is due to excluded or missing cases. Where there is no *P* value, χ^2 test could not be completed due to expected cell counts of <5.

[a]NI 115 was calculated from published methodology and includes children in Year 6 drunk more than twice in last 4 weeks, and Years 8 and 10 children who have been drunk more than twice, at least drunk once and taken drugs once or taken drugs at least twice in the last 4 weeks.

[b]Regular user of any substance is a composite variable which includes children in Year 6 drunk more than twice in last 4 weeks, and Years 8 and 10 children who have been drunk more than twice, at least drunk once and taken drugs once or at least twice in the last 4 weeks, and all children who smoke more than one cigarette per week.

use, with Year 8 children between two and six times more likely to misuse substances and Year 10 children between 11 and 20 times more likely than Year 6 children. However, only 26 children were in the reference group of regular users of any substance in Year 6, so this finding should be interpreted with some caution.

Discussion

Main finding of this study

Analysis of individual-level data within this study found that living in a low-income household (measured by eligibility for free school meals) and subjective wellbeing are associated with regular substance use in children and young people. Living in a low-income household increases the risk of substance misuse for young people, though older age appears to be the most influential factor. When these factors are controlled for, young people who report being happy or able to communicate with their family rather than friends, are less likely to be regular users of substances. Aspects of wellbeing may, therefore, be protective factors against substance use.

What is already known on this topic

It is plausible that unhappy children use substances to 'self-medicate' during adolescence, but it is also possible that use of substances may cause unhappiness.[15,31,32] Longitudinal studies are needed to investigate this further, and clarify the direction of the observed associations. Previous research using different indicators of subjective wellbeing showed no association between high self-efficacy, which may be linked

to self-esteem and smoking behaviour.[21,22] Another recent cross-sectional study also found that poor wellbeing was associated with increased alcohol use.[16]

Good communication with parents was negatively associated with substance use, whereas a preference for sharing problems with friends was positively associated with using substances. Poor relationships with parents and a low sense of family and school belonging have been shown elsewhere to predict substance use.[11,31,32] Peer pressure can promote increased experimentation and substance use,[29,30] and young people who value their friends' opinions over their parents' are known to be more likely to use substances.[32]

What this study adds

This study has exploited the potential of the Tellus4 data set to explore the subjective wellbeing of children at a local level. It highlights the value of nationally representative data that are available to local authorities at an individual level.

Our finding, that subjective wellbeing and substance use are associated with each other and with eligibility for free school meals has important implications. It raises the possibility that the use of indicators such as the N115 to monitor local authority performance may be penalizing areas with high proportions of low-income residents. Furthermore, the finding that substance use increases sharply between Years 8 and 10, particularly in respect of alcohol use amongst girls, emphasizes the need for continued implementation of drugs education in schools with younger pupils.

Limitations of this study

It is not possible to obtain a precise estimate of the prevalence of substance use among school-aged children from an

Table 4 Factors associated with the 'regular use of any substance' outcome variable

Variable	All children in sample, n (%)	Regular user of any substance[a], n (%)	Non-regular user of any substance, n (%)	P value (χ^2 test)	Odds ratio (95% confidence intervals)	P value	Adjusted odds ratio (95% confidence intervals)	P value
Happy with life	2548 (72.4)	232 (58.9)	2316 (74.1)	0.000	0.501 (0.404–0.622)	0.000	0.668 (0.518–0.861)	0.002
Has one or more good friends	3310 (94.8)	367 (93.1)	2943 (95.1)	0.106	0.707 (0.463–1.079)	0.108	—	—
Can talk to parents	2443 (70.1)	200 (50.5)	2243 (72.6)	0.000	0.384 (0.311–0.475)	0.000	0.507 (0.394–0.651)	0.000
Can talk to friends	2458 (70.8)	295 (75.6)	2163 (70.2)	0.026	1.318 (1.033–1.682)	0.026	1.373 (1.037–1.818)	0.027
Can talk to adult not mum or dad	1584 (45.7)	189 (48.2)	1395 (45.4)	0.297	1.119 (0.906–1.381)	0.297	—	—
Emotional health and wellbeing NI 50[b]	2201 (64.2)	232 (59.8)	1969 (64.8)	0.054	0.809 (0.652–1.004)	0.055	—	—
Year group								
Year group 6 (reference category)	1272 (35.6)	26 (6.5)	1246 (39.3)	0.000				
Year group 8	1142 (32.0)	76 (18.9)	1066 (33.3)		3.417 (2.173–5.373)	0.000	3.533 (2.127–5.867)	0.000
Year group 10	1158 (32.4)	301 (74.7)	857 (27.0)		16.832 (11.171–25.362)	0.000	17.978 (11.275–28.667)	0.000
Gender	1792 (50.6)	184 (46.1)	1608 (51.1)	0.058	1.233 (0.993–1.507)	0.059	—	—
Eligibility for free school meals	688 (19.9)	107 (27.2)	581 (19.0)	0.000	1.588 (1.250–2.018)	0.000	1.781 (1.356–2.339)	0.000

Totals vary due to exclusion of children who did not answer the question.

[a]Composite variable includes children in Year 6 drunk more than twice in last 4 weeks, and Years 8 and 10 children who have been drunk more than twice, at least drunk once and taken drugs once or at least twice in the last 4 weeks, and all children who smoke more than one cigarette per week.

[b] NI 50 was calculated from published methodology. It includes children who have one or more good friends and answer 'true' to at least two other questions from 'I can talk to my parents', 'I can talk to my friends', 'I can talk to an adult who is not my parent'.

online survey. Respondents who did not want to respond were excluded, and a proportion may have provided inaccurate answers. Concern over confidentiality of responses in a school setting possibly results in misleading answers, as could the natural tendency to 'show off'. However, the levels of self-reported substance use in our study are similar to those of other large UK studies[9,11] which suggests that the findings are reliable.

We created the main outcome measure of 'regular user of any substance' variable by combining the established formula with the number of children smoking more than one cigarette a week. This provided a robust methodology but makes comparisons to other literature more difficult. With a larger sample, e.g. by combining Tellus4 data from a greater number of local authorities, separate analysis of each of the substances (tobacco, alcohol and illegal drugs) would become possible.

The use of reported eligibility for free school meals as a measure of disadvantage may underestimate deprivation. Perceived stigma associated with free school meals deters some families from claiming, and it is possible that some may be unaware of their eligibility.[33] Categorizing all children into two groups does not reflect the complex nature of social disadvantage, and the gradients that exist in income and material wealth across different populations. Nevertheless, eligibility for free school meals does readily identify a low-income group who may be vulnerable to different environmental influences and social pressures.

Conclusions

The age of children is an important consideration when planning interventions to prevent regular substance use. Our findings suggest that policies that address income inequality and environmental factors may be an essential adjunct to individual-level interventions to reduce inequalities in health associated with substance use and enhance the health and wellbeing of young people in the UK.

Contributor statement

The authors designed the study together. S.F. analysed the data and wrote the first draft that was revised with B.H. B.H. is the guarantor.

Ethical approval

The University of Liverpool School of Population, Community and Behavioural Sciences Research Ethics Committee indicated that approval was not required.

Supplementary data

Supplementary data are available at the *Journal of Public Health* online.

Acknowledgements

Funding

Conflict of interest

None declared. All authors have completed the Conflict of Interest format http://www.oxfordjournals.org/our_journals/pubmed/for_authors/pubmed_coi.pdf (available on request from the corresponding author) and declare: no support from any organization for the submitted work; no financial relationships with any organizations that might have an interest in the submitted work in the previous 3 years; no other relationships or activities that could appear to have influenced the submitted work.

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