Is socioeconomic status in early life associated with drug use? A systematic review of the evidence

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Abstract

Aim. To conduct a systematic review of longitudinal studies that examined the association between childhood socioeconomic status (SES) and illegal drug use in later life. Design and Methods. Systematic search with an agreed list of search items was used to identify all longitudinal population-based studies that examined the association between childhood SES and later drug use. These included MEDLINE (1966–2005), EMBASE (1990–2005), CINAHL (1982–2005) and PsychInfo (1806–2005), and specialist databases of the Lindesmith Library, Drugscope and Addiction Abstracts. Foreign-language papers were included. Abstracts were screened independently by two reviewers. If there was disagreement to accept or reject the abstract, then a third reviewer acted as arbiter. Data were extracted by one of the authors. Results. Eleven relevant papers were identified (two birth cohorts and nine papers on school-aged cohorts). There was consistent evidence to support an association between lower childhood SES and later drug use, primarily cannabis use. However, few studies examined cannabis dependence, and studies of more problematic forms of drug use gave contradictory results. Discussion and Conclusions. We found consistent, though weak, evidence to support the assumption that childhood disadvantage is associated with later cannabis use. Further research is needed to clarify this issue and to inform future policies and public health messages. [Daniel JZ, Hickman M, MacLeod J, Wiles N, Lingford-Hughes A, Farrell M, Araya R, Skapinakis P, Haynes J, Lewis G. Is socioeconomic status in early life associated with drug use? A systematic review of the evidence. Drug Alcohol Rev 2009;28:142–153]

Key words: social class, socioeconomic factor, drug use, cannabis, systematic review.

Introduction

A causal relation between social disadvantage and illicit drug use is often assumed. For example, a report from the UK Advisory Council on the misuse of drugs concluded that ‘deprivation... is on the balance of evidence significantly and causally related to problematic drug use’ [1]. Such conclusions, though clearly plausible, have a limited empirical basis. Moreover, they are substantially based on cross-sectional data on adults with deprivation often measured at the ecological rather than individual level. Such data cannot strongly support conclusions around causality in individuals. The question of causality is of considerable importance. If deprivation in early life is an important cause of problematic drug use, then interventions to reduce disadvantage should be part of strategies to reduce drug-related harm.

The issue is also relevant to epidemiological investigations into the consequences of drug use. Social disadvantage, particularly in the early life course, is associated with increased risk of many unfavourable
adult health outcomes. If disadvantage is also associated with increased risk of drug use, then this may confound associations between drug use and poorer adult health. Alternatively, drug use may mediate associations between disadvantage and poorer health.

It is also possible, however, that social disadvantage is more a consequence than a cause of problem drug use. Overtly problematic drug use may lead to limited employment opportunities, higher risk of criminalisation and greater likelihood of residence in a deprived area. An association between deprivation and drug use among adults may also reflect confounding by common antecedents of both, such as psychological or behavioural problems. Clarifying these issues requires longitudinal data on all the above factors, ideally from studies able to consider the whole early life course. A minimum requirement is the availability of measures of socioeconomic status (SES) before the initiation of drug use in order to avoid the problem of reverse causation.

An important further consideration in this context relates to the measurement of SES and drug use. SES can be measured in various ways based on both subjective and objective characteristics of individuals and areas [2]. SES is a complex measure and concept. Occasionally, the apparent social patterning of a health outcome may depend on the measure of SES used; and the different indicators that comprise SES, such as material deprivation and education, may have distinct implications for policy. Measurement of drug use, and inference drawn from this, is similarly not straightforward.

Harms associated with drug use appear also to depend on the stage of the life course at which use is initiated. This may imply biological mechanisms related to periods of vulnerability, though may also reflect the fact that drug use during certain periods (particularly in pre or early adolescents) is unusual outside the context of a problematic life trajectory. In studies unable to clarify timing of drug use in the life course these subtleties cannot be examined. A further problem related to study of the social patterning of drug use arises from the social patterning of participation in research studies. The demography of study participants recruited from treatment settings will reflect the client population of the particular treatment facility. This may not be representative of the general population. Conversely, in general population-based studies it is likely that individuals with significantly problematic behaviours will be under-represented. This is both because such individuals are less likely to be recruited to a study and because they are more likely to be lost to follow up.

All the above considerations complicate interpretation of evidence on the association between social disadvantage and drug use. We conducted a systematic review of prospective, general population-based studies reporting associations between any measure of SES in early life and any measure of subsequent illicit drug use.

**Methods**

This systematic review was part of a larger review that investigated the association between social deprivation and illicit drug and alcohol use in later life [3]. This paper focuses on illicit drug use as the outcome, but the original search strategy incorporated both illicit drugs and alcohol use (see Appendix 1).

**Inclusion and exclusion criteria of selecting studies for this review**

Longitudinal population-based cohort studies that examined the association between SES of family of origin and illicit drug use at a later age were included in this review. Longitudinal studies of clinical populations were excluded, as were the findings from cross-sectional analyses of data gathered as part of a longitudinal study. Longitudinal cohorts identified were divided into birth cohorts, or studies of childhood and young adults.

In order to ensure complete coverage of the scientific literature, we used a broad definition of SES in order to include all longitudinal studies that examined the association between drug use and indicators of early SES: standard of living, occupation, parental employment and education.

**Search strategy for identification of studies**

We searched the electronic databases MEDLINE (1966–February week 7, 2005), EMBASE (1990–February week 7, 2005), CINAHL (1982–February week 7 2005) and PsychInfo (1806–February week 1 2005), as well as the specialist databases of the Linde-Smith Library, Drugscope and Addiction Abstracts, with an agreed list of search terms (Appendix 1). The MEDLINE search strategy was adapted for use in all databases in order to ensure that the vast majority of the relevant literature was covered. Abstracts identified by this process were screened by one of the authors (J.D.) in order to remove all the clearly irrelevant abstracts. The inclusion of text words in the search strategy enhanced the coverage of the literature, but resulted in many irrelevant references being retrieved that were subsequently excluded. Papers of foreign languages were included in the review and, where appropriate, were reviewed by an expert fluent in that language (this accounted for 16 studies, in German, Spanish, Norwegian and Swedish).

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Data extraction and assessment of methodological quality

Abstracts were then screened independently by two reviewers and excluded if the abstract or title indicated that the paper was unrelated to the review. If there was disagreement to accept or reject the abstract, then a third reviewer acted as arbiter. If a decision could not be made, on inclusion or exclusion of the paper the paper was included in the next stage of the review. Full-length papers were then obtained and reviewed independently by two of the authors. A standardised data extraction form was used to review papers and those included had main findings and methodological details recorded.

Methodological details extracted included response rates at baseline and follow up, length of follow up, geographic location of cohort and participants who were sampled, details of the type of SES measure or measures used and measurement of drug use. Results were also extracted, including details of any adjustment for confounding, and other potential sources of bias were noted. Studies were not rated using numerical ‘quality scores’ as these are unreliable and may give a false sense of objectivity [4]. Thus, comparison of the methodological quality of the included studies was based on discussion of the details listed previously.

Results were summarised descriptively. Study heterogeneity (in terms of their methodology, quality, populations, follow-up periods and measures) precluded the possibility of informative quantitative synthesis through meta-analysis.

Results

Figure 1 illustrated the stages of the review, including reasons for exclusion of studies at each stage of the review. Overall, 5077 abstracts were identified as being potentially relevant, with 4699 abstracts subsequently excluded. In total, 68 abstracts were screened by a third reviewer because of disagreement over whether to include or exclude the abstract at the initial review stage. The main reasons for exclusion were: not a longitudinal study design; sample obtained from a clinical setting; no measure of SES, or totally irrelevant. In total, 378 papers were double-reviewed identifying 22 longitudinal studies of SES and illicit drug use, of these a further 11 were excluded because the measure did not relate to early life, leaving a total of 11 studies that examined the link between SES in early life and illicit drug use.

We summarise and present the longitudinal studies in two sections: birth and school-aged cohorts. Tables 1 and 3 summarise the sampling frame, response rates at baseline and follow up, length of follow up, sample size and type of analysis. Tables 2 and 4 summarise the drug measure, SES measure, main findings and adjustments.

Birth cohorts

Tables 1 and 2 show key findings of two birth cohort studies measuring drug use and SES, both conducted in New Zealand. Fergusson and Horwood [5] and Ferguson et al. [6] report on the follow up (after 16 and 21 years) of a cohort of 1256 subjects recruited in Christchurch, investigating SES, employment and cannabis use and abuse or cannabis dependence. By 21 years, 7.3% of the sample met criteria for cannabis abuse and 4.3% met criteria for cannabis dependence [6]. The Dunedin cohort followed up approximately 900 subjects at 21 years, reporting on the effect of social deprivation in childhood and unemployment of the participant [7].

Significant associations between measures of SES and self-reported cannabis or illicit drug use were reported in the four studies from the two birth cohorts. Thus, frequency of cannabis use was significantly more common in families of lower SES and low SES during childhood.

School-aged cohorts

In all, nine studies were identified assessing SES and illicit drug use among cohorts recruited at school age. Cannabis was the most commonly studied drug in seven studies, with one study measuring illicit drug use per se and three studies measuring cocaine, injection or other more problematic types of drug (Tables 3 and 4). Overall, measures of drug use prevalence were not always reported, and also varied from less than 10% [8] to more than 25% [9].

Socioeconomic status also was measured in a multiplicity of ways: maternal education, father or mother’s occupational social class, standard of living or parental income, level of deprivation of environment and aggregate measure of SES. Miller and Miller carried out an analysis on a school-aged cohort followed up over a 1 year period and provided some evidence for an association between cannabis use and the Hollingshead Index of Deprivation for male participants [10]. The Hollingshead index is a standard composite of several indicators, which has not been updated to reflect changes in occupational structure and is rarely used [11]. Jeynes conducted an analysis of SES, comprising parental education, income and occupational status, among students aged 13–14 years followed up over 4 years [12]. The study found that cannabis use was positively associated with low SES of parents. Stenbacka et al. also found the same association for injecting drug use and social class [13].

Two studies [9,14] failed to find a significant association between cannabis use and measures of SES.
classified either as upper to lower class or based on
maternal education and fathers’ occupation among
school children aged 9–17 years followed up for
19 months, or students aged 17–20 years followed up
for 2 years, respectively.

Three studies measured SES in terms of education. Aseltine et al. assessed substance use and two SES vari-
ables (standard of living and social class, based on
parents’ education and family income) among a
community-based school-aged cohort of 900 adoles-
cents [15]. Participants whose parents were less edu-
cated or had a lower standard of living reported greater
adolescent substance abuse, although this was not sta-
tistically significant. Brunswick and Messeri reported
that, in men, illicit drug use in adolescence was related
to lower levels of maternal education [16].

Two studies assessed drug use in relation to employ-
ment and income. Duncan et al. suggested that those
who are economically disadvantaged are likely to
increase their cannabis consumption [17]. Stenbacka
provided conflicting evidence of association between
family economic circumstances and injecting drug use
[13,18].

Finally, one study measured SES in relation to child-
hood environment. Ensminger et al. investigated a
sample of school starters from Woodlawn district, a

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Figure 1. Outline of search results and application of inclusion/exclusion criteria. SES, socioeconomic status.
deprived area in Chicago, USA, and followed them up until they were 31–34 years old, interviewing them on two occasions after recruitment and comparing findings with a national comorbidity study \[8,19\]. They reported higher proportions of reported illicit drug use among subjects from the Woodlawn cohort compared with US general population, but found no significant association between dependence and poverty (as defined by official US definition based on housing and family size).

**Discussion**

These results provide general support for the existence of an association between social disadvantage and use of illicit drugs, though primarily only for cannabis. In contrast, we found little robust evidence to support the assumption that childhood disadvantage is associated with later alcohol use/abuse \[3\]. This review also, however, illustrates the limitations of existing evidence and the difficulty in interpreting this evidence.

Two birth cohort studies from New Zealand showed a consistent association between more than one indicator of childhood SES (in some cases a composite indicator was used) and greater use of cannabis in early adolescence (before the age of 16 years). Whether these associations persisted with later cannabis use was not reported. Cannabis use in early adolescence may have a stronger association with subsequent harm than later cannabis use; however, the basis for this association is unclear. Adjustment for potential confounding factors likely to vary with both childhood SES and later drug use was limited. The opportunity to compare adjusted with unadjusted estimates was not always available; hence, the possibility of confounding was difficult to assess.
We identified only nine prospective studies reporting associations between childhood SES and subsequent drug use. Other longitudinal studies were rejected often because measures of SES did not relate to childhood/early life before onset of drug use, and therefore, could not clarify direction of causality. Some of the studies selected also reported findings, which we have not highlighted here, relating contemporaneous SES measures to drug use. For example, Hammer and Vaglum reported that cannabis use was highest among those who had dropped out of high school [9]; and Fergusson et al. report that unemployment after leaving school was significantly associated with illicit drug abuse and dependence [6]. In addition, in several of the adolescent studies it is possible that participants initiated drug use before study recruitment, although reverse causation is unlikely given that SES measured on the parent recall bias must be considered. Nonetheless, these studies showed a relatively consistent association between several markers of childhood disadvantage and subsequent cannabis use.

Most of the studies examined cannabis use as an outcome rather than cannabis dependence, or often more problematic forms of illicit drug use such as heroin, cocaine or injecting drug use. Among the few studies where the association between these latter categories of drug use and earlier disadvantage was reported, these associations were generally weak and of small magnitude. In contrast, several cross-sectional studies have reported substantial and strong associations often seen between disadvantage and serious problem drug use in adult cross-sectional studies [20–22]. Unfortunately, the extent of any 'reverse causation' (with current drug users having a higher probability of living in deprived areas) is unclear. The discrepancy in the evidence also may reflect limited power of longitudinal studies (because of small numbers of users of drugs other than cannabis) and selection bias (i.e. that drug users identified in cross-sectional surveys may not be representative of all drug users). For example, two cross-sectional studies report higher cocaine use among more affluent individuals [23,24], which is likely to be explained as reverse causation.

A limitation of all the studies was that the association between SES and illicit drug use rarely appeared to be an explicit focus or main hypothesis of the studies identified. Rather, SES appeared to be generally seen as an adjustment variable not necessarily of interest in its own right. SES also was measured in several different ways, and often only at one point in time, which may give misleading picture of social environment during periods of the life course. Ensminger et al. analysed social disadvantage more in terms of an ecological association, which fails to control for individual circumstances [8,19]. Nonetheless, a relatively consistent picture of early-life adversity increasing the risk at least of illicit cannabis use was apparent.

In general, most of the school- and adolescent-based studies report unadjusted associations between SES and illicit drug use. This limited the opportunity to assess both potential confounding by common antecedents not on the same causal pathway (such as parental drug use) and mediation by factors such as conduct

Table 2. Birth cohorts: SES and drug use: summary of results

<table>
<thead>
<tr>
<th>Study</th>
<th>SES measure</th>
<th>Main findings</th>
<th>Adjustment/bias</th>
</tr>
</thead>
<tbody>
<tr>
<td>McGee et al. [7] New Zealand</td>
<td>SE disadvantage—based on low SES, young mother at first pregnancy and low level of maternal education and single parenting</td>
<td>51% of cannabis users at age 15 were classed as low SES compared with 34% among non-users. (\chi^2 = 15.53, P &lt; 0.05) Adjusted OR = 1.8 for cannabis use in low SES (no CI stated)</td>
<td>Adjusted for sex, behavioural problems, family conflict and poor parent-child relationship</td>
</tr>
<tr>
<td>Fergusson and Horwood [5] New Zealand</td>
<td>Family SES—semi-skilled or unskilled (assessed using the Elley and Irving classifications system) Education—maternal education (assessed using a three scale which reflected the highest level of attainment)</td>
<td>Association between cannabis frequency (aged 15–16 years) and SES: 44% of those in lowest SES were frequent cannabis users (≥10 times), compared with 33% among those who had used cannabis 1–9 times and 22% among those who had never used cannabis (P &lt; 0.001) 64% of those whose mothers had no formal education used cannabis frequently, compared with 33% and 22% for those using cannabis less frequently or never (P &lt; 0.05)</td>
<td>No adjustment</td>
</tr>
</tbody>
</table>

Main findings include (where reported) effect sizes (OR = odds ratio) and confidence intervals (CI). P-values for effect sizes are included if no data on confidence intervals are reported or, as appropriate, for other hypothesis tests. In the absence of formal statistical testing, details of comparisons or statements made are summarised. SES, socioeconomic status.

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<table>
<thead>
<tr>
<th>Study</th>
<th>Sampling frame</th>
<th>Age, response rate (RR) at baseline, length of follow up &amp; RR at follow up</th>
<th>N in analysis and type of analysis</th>
<th>Drug measure/timing of outcome</th>
</tr>
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<tbody>
<tr>
<td>Brunswick and Messeri [16]</td>
<td>Stratified probability sample within a single health district—Central Harlem, New York City</td>
<td>12–17 years RR = 80% at baseline 6–8 years</td>
<td>351</td>
<td>Self-report use of nine illicit substances</td>
</tr>
<tr>
<td>Coombs et al. [14]</td>
<td>Ethnographic research—75% of participants recruited from youth centres, remainder through referral and other sources</td>
<td>9–17 years RR = not stated 19 months RR = not stated 17–20 years RR = 85% 2 year follow up RR = 68%</td>
<td>400</td>
<td>Self-report (questionnaire) Cannabis—frequency of use on 5-point scale: none to 30 plus times per month</td>
</tr>
<tr>
<td>Hammer and Vaglum [9] Norway</td>
<td>Stratified sample of national survey investigating work and school adjustment carried out every 5 years—stratification based on main occupation and education in 1985</td>
<td></td>
<td>1590</td>
<td>Self-report (questionnaire) Cannabis use at t1—measured by means of three questions—relating to earlier use, age at first use, total frequency of use and use of past year—current use of cannabis is defined as any use over the past year</td>
</tr>
<tr>
<td>Miller and Miller [10] USA</td>
<td>Probability sample of households—national youth survey All youths aged 11–17 on 31 December 1976—eligible to participate</td>
<td>11–17 years RR = 73% 1 year RR = 94.5%</td>
<td>1043</td>
<td>Self-report (interview) Cannabis—frequency of use in past year on a 9-point scale: never to 2–3 times per day</td>
</tr>
<tr>
<td>Aseltine et al. [15] USA</td>
<td>Probability sample of 9th, 10th, 11th grade pupils in three US community high schools. Unclear why these schools were sampled</td>
<td>14–17 years RR = 77% 2 years RR = 73%</td>
<td>900</td>
<td>Self-report cocaine and cannabis use—frequency of use. Over 1 year at T1 and over 30 days at T2—rated on ordinal 5-point scale, from 0 to 10+ times Substance abuse defined as those in the top decile of any of three measures (cocaine, cannabis or alcohol)</td>
</tr>
<tr>
<td>Study</td>
<td>Title</td>
<td>Country</td>
<td>Sample Description</td>
<td>Follow-up Period</td>
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<tr>
<td>Duncan et al. [17]</td>
<td>Advertising for families with at least one child through media—11–15 years and siblings over 11 years old—not stated over what period sampled. From two north-western urban areas.</td>
<td>USA</td>
<td>11–15 years RR = unclear No details on repeated measures</td>
<td>Self-report (questionnaire)</td>
</tr>
<tr>
<td>Jeynes [12]</td>
<td>Two-stage probability sample—sample drawn from 8th grade students in the National Educational Longitudinal Survey—state a 'nationally representative' sample of schools—no other details.</td>
<td>USA</td>
<td>13–14 years RR = unclear 4 year follow up RR = 76%</td>
<td>Cannabis—self-report of lifetime use</td>
</tr>
<tr>
<td><strong>Swedish conscripts study</strong></td>
<td>Military conscript study—residents of Stockholm county All male population aged 18–19 years</td>
<td>Sweden</td>
<td>18–19 years RR &gt; 95% 18 years RR = 98%</td>
<td>Physical examination—examination for injection marks at police stations—in all arrestees in Stockholm—later in adulthood</td>
</tr>
<tr>
<td>Stenbacka [18]</td>
<td>As above</td>
<td>Sweden</td>
<td>As above</td>
<td>No formal statistical testing</td>
</tr>
<tr>
<td><strong>Woodlawn study</strong></td>
<td>All first graders who attended nine public/parochial schools recruited over 1966–1967</td>
<td>USA</td>
<td>6 years RR = 99% To age 31 RR = 76.7%</td>
<td>Self-report (interview)</td>
</tr>
<tr>
<td>Ensminger et al. [19]</td>
<td>As above</td>
<td>USA</td>
<td>As above</td>
<td>953</td>
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<tr>
<td>Study</td>
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<tr>
<td>Brunswick and Messeri [16] USA</td>
<td><strong>Education</strong>—maternal education</td>
<td>Association between illicit drug use and maternal education: the sons of better-educated mothers were less likely to use illicit drugs: standardised regression coefficient = 0.15, ( P &lt; 0.05 ); but no significant association was found for girls (standardised coefficient = 0.13, ( P &gt; 0.1 ))</td>
<td>Multiple regression model—adjusted for age, father present, migrant, reading test scores, number of close friends, spend time with family, alienation, short-time orientation, personal efficacy, social expectancy, perceived weight, food consumption</td>
<td></td>
</tr>
<tr>
<td>Coombs et al. [14] USA</td>
<td>SES—parental ranking—upper, upper-middle, middle, working, lower</td>
<td>Only 8% of those with parents of upper-middle class used cannabis compared with 9% of those of lower class</td>
<td>Highly selected cohort</td>
<td></td>
</tr>
<tr>
<td>Hammer and Vaglum [9] Norway</td>
<td><strong>Social class</strong>—based on fathers’ occupation, or if missing, mothers’ education (Skrede. 1971 index for classification of social groups was used)</td>
<td>No significant difference by social class, middle class (14%) vs. working class (12%), ( P &gt; 0.05 )</td>
<td>Self-report measure of cannabis use—only brief measure of use</td>
<td></td>
</tr>
<tr>
<td>Miller and Miller [10] USA</td>
<td><strong>Standard of living</strong>—self-report question—what best describes your family’s standard of living: very well off, very comfortable, reasonable comfort, just getting along, nearly poor, poor</td>
<td>Those with a lower standard of living or with less educated parents were more likely to report substance abuse, but these correlations were not significant at ( P = 0.01 ).</td>
<td>No adjustment</td>
<td></td>
</tr>
<tr>
<td>Miller and Miller [10] USA</td>
<td><strong>Social class</strong>—measured by parents’ highest level of education, from less than eight grades of school to graduate/professional school</td>
<td>Correlation between standard of living and substance abuse is ( -0.05 ). Correlation between parental education and substance abuse is ( -0.067 ).</td>
<td>Middle class sample with differential attrition</td>
<td></td>
</tr>
<tr>
<td>Aseltine et al. [15] USA</td>
<td>SES—measured by the Hollingshead index</td>
<td>Cannabis higher among men in lowest quartile vs. 2nd: ( OR = 1.85 (0.81, 4.17) ) vs. 3rd: ( OR = 3.33 (1.45, 7.69) ) vs. 4th: ( OR = 1.72 (0.80, 3.70) )</td>
<td>Adjusted for alcohol use, peer use, urban residence</td>
<td></td>
</tr>
<tr>
<td>Duncan et al. [17] USA</td>
<td>SES—based on parental income (16-point scale) and education (7-point scale)</td>
<td>Economic disadvantage increased their use of cannabis at higher rate. (SES was significant predictor of the growth rate of marijuana use, ( -0.25, t = -1.97 ), ( P &lt; 0.05 ). SES accounted for 4% of the variation in family growth rate for Marijuana.)</td>
<td>Marital status and step foster family status was included in models as well as age, sex.</td>
<td></td>
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<tr>
<td>Jeynes [12] USA</td>
<td>SES—of child’s family based on parental occupations and education, and family income</td>
<td>Those in the lowest SES groups (quartiles 3 &amp; 4) were more likely to use cannabis consumption than those of higher SES. Quartile 2 vs. 1: regression coefficient = 0.05, ( P &gt; 0.05 ) Quartile 3 vs. 1: regression coefficient = 0.06, ( P &lt; 0.05 ) Quartile 4 vs. 1: regression coefficient = 0.05, ( P &lt; 0.05 )</td>
<td>Adjusted for marital status, ethnic group and sex</td>
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</tbody>
</table>
disorder and other early behavioural and psychological difficulties [25].

The relatively narrow geographical distribution of studies, most were from North America, with two others each from Scandinavia and New Zealand, also may limit generalisability to UK (or many other countries). Most studies measured childhood disadvantage experienced between 1970 and 1980 and do not allow inference on effects of disadvantage experienced by more recent cohorts in whom drug use appears to be particularly high—for example, contemporary adolescents in the UK [26]. Furthermore, all studies identified measured drug use through uncorroborated self-report [27]. Reporting of drug use is likely to be influenced by notions of social desirability, which may vary according to SES. It is difficult to predict the direction of any resulting bias as, conceivably, disadvantage may be associated with a greater or a lesser tendency to report drug use.

There is a need for longitudinal studies better able to consider this issue of reporting bias through the incorporation of objective measures of drug use. The study of social risk factors for seriously problematic drug use (e.g. injection use) in general population samples is likely to remain difficult, because such individuals retained in studies of this type are likely to be both atypical and small in number. Innovative, alternative approaches may be necessary to clarify this issue.

Currently, it is possible to conclude, tentatively, that cannabis use appears likely to be an additional sequela of childhood disadvantage, an association that further strengthens the rationale for interventions to reduce disadvantage early in the life course. However, further research is needed to clarify the nature of this association with regard to different patterns of drug use and the mediating factors through which it arises.

### References


Appendix 1. Search strategy

1. exp 3,4-methylenedioxyamphetamine/
2. exp amphetamine/
3. exp substance-related disorders/
4. exp designer drugs/
5. exp street drugs/
6. N-Methyl-3,4-methylenedioxyamphetamine/
7. exp METHADONE/
8. exp opioid-related disorders/
9. (smack or illicit substance).tw.
10. (amphetamine$ or benzedrine or cannabis or cocaine or codeine or crack or ecstasy or ganja or gateway or hallucinogen$ or hash or hashish or pot or draw or pills or ketamine or khat).tw.
11. (lsd or lysergic acid diethylamide or lysergide or magic mushroom$ or marihuana or marijuana or MDA or MDEA or mescaline or methadone or methamphetamine$ or 3,4-methylenedioxyamphetamine or morphine or narcotic).tw.
12. (opiate$ or opioid or psilocybin or qat or smack or speed or spiff or substance or used disorder or temazepam or tetrahydrocannabinol or uppers or downers or weed).tw.
13. ((substance$ or drug$ or marijuana or heroin or narcotic) adj10 (use$ or misus$ or abus$ or addict$ or depend$ or rehab$ or hallucinogen$ or psychotropic or psychoactive or psychedelic or street or designer or disorder)).tw.
14. (((volatile adj10 substance) or freebase) adj10 (amphetamine$ or cocaine)).tw.
15. glue sniffing.tw.
16. 1 or 2 or 3 or 4 or 5 or 6 or 7 or 8 or 9 or 10 or 11 or 12 or 13 or 14 or 15
17. exp cohort studies/
18. exp longitudinal studies/
19. exp prospective studies/
20. ((cohort or longitudinal or prospective) adj3 stud$).tw.
21. (Epidemiolog$ adj3 (survey or study or sample)).tw.
22. 17 or 18 or 19 or 20 or 21
23. (spending power or SES or socio-demographic or socio-economic deprivation or education or social problems or poverty or prostitution or car ownership or fall income or employment status or manual non-manual).tw.
24. exp socioeconomic factors/
25. exp psychosocial deprivation/
26. (rented adj3 (accommodation or housing)).tw.
27. (ownership adj3 car).tw.
28. (social class and (I or II or III or IV)).tw.
29. (change adj3 income).tw.
30. exp poverty/
31. exp social class/
32. exp homeless person/ or exp homeless youth/
33. exp occupations/ or exp career mobility/
34. occupational class.tw.
35. 23 or 24 or 25 or 26 or 27 or 28 or 29 or 30 or 31 or 32 or 33 or 34
36. 16 and 22
37. 16 and 35
38. 16 and 22 and 35