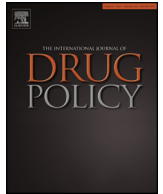




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### Review

# Positive youth development programmes to reduce substance use in young people: Systematic review

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#### ABSTRACT

**Background:** Substance use has detrimental short-term and long-term consequences for young people. Positive youth development (PYD) interventions, which favour promotion of positive assets over traditional risk reduction, have received attention recently as a possible intervention to prevent adolescent substance use. We aimed to synthesise the evidence on PYD interventions for reduction in substance use in young people.

**Methods:** We searched 21 databases, including MEDLINE, PsycINFO, CINAHL and CENTRAL, and hand-searched key journals and websites. We included studies with more than half of participants aged 11–18 years where interventions meeting a pre-specified definition of PYD were delivered in community settings outside of normal school hours and did not target parents or young people with pre-defined conditions. Two reviewers screened records, assessed full-text studies for inclusion, and extracted data. A modified Cochrane risk of bias tool was used for quality assessment.

**Results:** Ten studies reported in 13 reports were included in our synthesis. PYD interventions did not have an effect of statistical or public health significance on any substance use, illicit drug use or alcohol outcomes in young people.

**Conclusions:** Interventions were diverse in content and delivery. Our review suggests that existing PYD interventions subject to evaluation do not appear to have produced reductions in substance use of public health significance. However, these interventions may not be the best exemplars of a PYD approach as explained above. Therefore, our findings should not be taken as evidence for the ineffectiveness of PYD as a theory of change for reducing substance use among young people. Additional rigorous evaluation of PYD interventions is key before further investment. Evaluations were of highly variable quality. Though searches were extensive, we were unable to test for publication bias.

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### Introduction

Youth substance use continues to pose a threat to public health. These threats are both immediate and longer-term. For example, adolescent use of cannabis is associated in the short term with increased risky sexual behaviour and injury (Volkow, Baler, Compton, & Weiss, 2014). Substance use initiation during adolescence leads to later-life chronic disease, including

dependence, and is costly to healthcare systems (DWP, 2012; Viner et al., 2012). In a nationally representative sample of United States adolescents from 2011, 22% of adolescents in the last year of secondary school and 15% of adolescents in the second year of high school reported binge drinking in the last month (Patrick & Schulenberg, 2014). Another nationally representative sample showed that adolescents in the second year of high school reported last-year illicit drug use of 26% (Conway et al., 2013). Moreover, adolescent substance use initiation is associated with social disadvantage across studies (Galea, Nandi, & Vlahov, 2004), raising a key equity consideration.

A class of interventions that may have the potential to prevent initiation of substance use is positive youth development (PYD). Specifically for this review, we defined PYD from research evidence

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in the United States (Roth & Brooks-Gunn, 1998) and policy and practice sources in the United Kingdom (NYA, 2007) as voluntary education outside school hours aiming to promote generalised (beyond health) and positive (beyond avoiding risk) development of assets (bonding, resilience, social, emotional, cognitive, behaviour or moral competence, self-determination, spirituality, self-efficacy, clear and positive identity, belief in the future, recognition for positive behaviour, opportunities for pro-social involvement and/or pro-social norms), which addresses multiple assets or a single asset deployed in multiple domains (for example, family, school or neighbourhood). Formal usage statistics do not exist, but PYD interventions have recently been the focus of policy interest in the United Kingdom, including multi-million pound investments by the UK government in youth work, youth centres and other related projects. PYD also features prominently in key UK government agendas, including the Department for Education (Department for Education, 2011), the Department of Health (Department of Health, 2010), the London mayor's office (Mayor's Fund For London, 2011), and the devolved governments of Scotland (Scottish Government, 2009) and Wales (Welsh Assembly Government, 2007).

The evidence base for PYD as regards substance use outcomes is unclear. Though other systematic reviews (Gavin, Catalano, David-Ferdon, Gloppen, & Markham, 2010; Harden et al., 2006) have found positive effects of PYD on sexual health outcomes, substance use specifically has not been addressed in a systematic review. Two existing reviews (Catalano, Berglund, Ryan, Lonczak, & Hawkins, 2002; Roth & Brooks-Gunn, 2003) addressing PYD and substance use are out of date, though Catalano, Berglund, et al. (2002) suggested that PYD could be effective for reducing substance use. A more recent review focused only on school extra-curricular interventions reported a significant effect in reducing problem behaviours, but a non-significant effect for drug use (Durlak, Weissberg, & Pachan, 2010). In the face of the challenges to the health and development of young people that substance use presents and the ongoing investment in these programmes, a systematic review of outcome evaluations of PYD interventions is timely and necessary to guide policymaking and set the agenda for future research.

## Methods

We conducted this systematic review as part of a larger evidence synthesis project addressing theory, process evaluations and outcome evaluations of PYD interventions. We determined our methods a priori and published them in a protocol (Bonell, Thomas, Campbell, Murphy, & Fletcher, 2013). We included studies in the overall review if they: (1) were published from 1985 onwards, which is when PYD interventions were first developed (Gavin et al., 2010); (2) were in English; (3) focused on youth aged 11–18 years (i.e. more than half of youth included were 11–18 years); (4) focused on PYD as defined above; (5) reported a theory of change, process evaluation or outcome evaluation that was experimental (i.e. randomised) or quasi-experimental (i.e. non-randomised, but employing a prospective comparison group); and (6) focused on prevention of smoking tobacco, alcohol consumption, drug use or violence. In the systematic review reported here, we examine and synthesise only experimental or quasi-experimental outcome evaluations that included substance use outcomes (violence outcomes are reported elsewhere). We applied the above definition of PYD and included interventions in this evidence synthesis project meeting the definition above if either at least one asset characteristic of PYD applied to multiple domains (e.g. family, school, or community), or multiple assets applied to one domain.

We searched 21 bibliographic databases on 7 November, 2013, in addition to a free-text search of websites (undertaken between 7 and 16 January, 2014) and hand-search of journals (see

Supplementary File 1 for details of search strategies and data extraction). We initially screened studies in pairs of researchers assessing sets of the same 100 references, moving to single screening when an agreement rate of 90% was achieved. We repeated this process for assessing full-text studies where the first screening indicated potential inclusion or where the reviewers believed there was insufficient information to judge. We conducted data extraction and study quality appraisal in duplicate and independently using, respectively, an extraction form that was initially piloted on two studies and a modified version of the Cochrane risk of bias tool (Higgins & Green, 2011).

Effect sizes from included study reports concerning substance use (smoking, alcohol or drugs) as defined in the protocol (Bonell et al., 2013) were extracted into a Microsoft Excel spreadsheet and converted into standardised mean differences (Cohen's *d*) using all available information as presented for each study. As recommended by the Cochrane Handbook (Higgins & Green, 2011), when the evaluation was designed as a randomised controlled trial, we extracted the 'least adjusted' effect size estimates from each evaluation (i.e. uncontrolled estimates, or estimates controlling for baseline scores). When the evaluation was a matched or otherwise non-randomised design, we extracted the most adjusted effect size estimates (i.e. estimates in which the full vector of control variables was included). We adjusted direction as necessary so that positive effect sizes indicate an effect favouring the intervention. When studies did not present enough data to calculate effect sizes, we contacted study authors several times as needed for additional information. When we needed to impute additional data to calculate an effect size, we specified a range of reasonable assumptions and sensitivity analysed our findings. We standardised direction of the effect sizes so that positive effect sizes indicated a reduction in substance use.

In preparation for meta-analysis, we grouped effect sizes into several categories that we meta-analysed separately according to whether they were measures of: 'omnibus' substance use outcomes (where studies reported a generic measure of illicit drug use, alcohol consumption and/or tobacco smoking); illicit drug use; alcohol consumption; or smoking tobacco. We meta-analysed these outcomes both separately and together in an 'all substance use' model, and we estimated a subset of outcomes in models addressing short-term outcomes captured between post-intervention and four month follow-up, inclusive. We did not meta-analyse long-term outcomes separately because of the large variation in follow-up times beyond 4 months post-intervention. As indicated in the protocol (Bonell et al., 2013), we intended to use multivariate meta-analysis or another method to synthesise effect sizes in this situation. However this was not possible because of the heterogeneity of reported outcomes and lack of availability of a correlation matrix for reported outcomes. Instead, we used a multilevel meta-analysis model (Cheung, 2014) with random effects at both the outcome and study level, as this model did not require us to specify a correlation matrix. The resultant pooled effect size estimate includes all information that the multiple effect size estimates contribute while correcting for the non-independence of multiple effect size estimates from each study.

This review was managed in EPPI-Reviewer (Thomas, Brunton, & Graziosi, 2010) and analyses were undertaken using the R package metafor (Viechtbauer, 2010). This project was approved by the research ethics committee of the Institute of Education's Faculty of Children and Learning (ethics approval reference number FCL 544).

## Results

Searches yielded 32,394 de-duplicated abstracts, of which 689 were screened in full text (see Fig. 1). We included 13 study

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