



Sport and physical activity – The relationship with crime, drugs, alcohol and smoking; a look at the research

Low levels of physical activity are a major public health challenge, contributing to the national burden of non-communicable disease and demand on health and social care services. Regular physical activity is proven to help prevent and manage noncommunicable diseases (NCDs) such as heart disease, stroke, diabetes and several cancers. It also helps prevent hypertension, maintain healthy body weight and can improve mental health, quality of life and well-being.

Sport and physical activity are also widely known to contribute towards other areas of health, including emotional wellbeing, behaviour, attainment and pro-social conduct. Positive activities are considered as having a useful role for developing young people's resilience and enhancing protective factors [1]

This report highlights some of the available literature on the impact that sport and physical activity could have on crime, drugs, alcohol and smoking. It will explore some of the recommendations and considerations that could be put into practice at 'place'.

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1.0 Sport, Physical activity and crime

The majority of findings and literature on Sport and Crime come from the 2020 Loughborough University, Street Games and Derbyshire Police and Crime Commissioner report on [Sport and Serious Youth Violence literature review summary](#) by Dr Caron Walpole, Dr Carolynne Mason, Professor Stephen Case and Professor Paul Downward. [2]

Their report summarised that the evidence base around the use of sport to support prevention and early intervention is limited. However, their recommendations included the following:





1.1 Sport's contribution to Universal programmes (Primary prevention)

Sport, in its role as a positive activity, is well placed to take a universal, preventative role. Positive activities are considered as having a useful role for developing young people's resilience and enhancing protective factors [1]

The positive role that sport can have for young people who have experienced complex trauma as a result of gang violence either as bystanders or members might also be valuable for sport to consider at the design stage of universal or targeted programmes as appropriate. However, sufficient levels of expertise and resources will need to be put into place to protect against the risk of doing harm.

Van der Kolk (n.d, p12) [3] recommends that group activities based on 'safety', 'predictability' and 'fun' can make a positive contribution to trauma recovery once young people have received sufficient support to enable them to take part in simple group activities.

Skuse and Matthew (2014) [4] identify the need for structure and routine in everyday life as well as the need to develop trusting relationships with appropriate adults as the foundation for trauma recovery programmes.

1.2 Sport's contribution to Targeted programmes (Secondary prevention)

Sport can make a contribution to targeted early intervention programmes within a holistic approach to working with targeted young people. Whilst the evidence base for targeted early intervention programmes is still relatively weak, the following factors should be considered in planning a targeted programme that involves sport:

- Targeted delivery requires an appropriate level of expertise of both sport programme managers and delivery staff e.g. coaches, leaders and volunteers.
- Sufficient level of resources to make sure that funding is in place for staff, activities and the time and level of services required to support young people [5]
- Plans for long-term funding to support the effective engagement and relationship-building with young people [5]
- The use of a wider developmental programme of education and support [5]
- Avoiding the use of 'scare tactics' such as bringing together high-risk young people and adult offenders in prison as this increases the likelihood of young people committing crime [1]
- Ability to deliver what has been promised in terms of the engagement and retention of targeted young people and able to collect convincing evidence of the benefits and outcomes.
- Identification of the potential risks if the sports programme does not deliver what has been promised.

It should be noted that the impact of short-term funding can hinder the ability of frontline practitioners to plan ahead and to work collaboratively and can create competition for resources rather than foster collaboration [5]





Street Games have created a 'Theory of Change' model [6] which outlines how sport can be harnessed to develop interventions which provide positive experiences for young people and support the development of pro-social identities. That resource can be viewed [here](#).

Their Theory of Change model is useful in explaining how and why positive change occurs in and through engagement in sport. The theory argues that 'prosocial behaviour is learnt and therefore has the same underlying developmental processes as anti-social behaviour' (p.3) and that Sport has a powerful role to play in developing said pro-social behaviour.

1.3 Other research findings

A more recent review performed in 2020 by Brosnan, S [7] looking at sports participation and crime in England found a relationship that suggested that 'a 10% increase in sports participation is associated with a fall in violent crimes of 0.97 and 1.56% while a 10% increase in sports participation is associated with a fall in property crimes of approximately 0.65%' (p.1090). This could have implications on the role that traditional sport participation plays in local work on increasing levels of physical activity.

More generalised research from the WHO on sedentary time in children [8] has shown that high levels of sedentary time is associated with poor behaviour and poor pro-social behaviour. Pro-social activities have been associated with a reduced likelihood of contact with the youth justice system and less contact with gang members [9]

There are a range of other pieces of international research that suggest a positive relationship between anger, violence and aggression and sport or physical activity including:

- 1) A piece of research published in the 'Paediatric Exercise Science journal' from Tkacz J et al. in 2008 [10] which found that 'An aerobic exercise program might be an effective strategy to reduce anger expression, including reduction of aggressive behaviour, in overweight children' (p401)
- 2) A randomised control trial published in the 'American Journal of Health Behaviour' in 2017 from Edwards M K et al. [11] found that 'Exercise was effective in regulating anger and anxiousness after a stressful event' (p534) The research also suggested that walking and jogging can offer a protective emotional effect.
- 3) An article published in the Howard Journal of Crime and Justice in 2008 [12] stated that programmes such as outdoor adventure activities that offer supportive staff role models, skills development and a sense of accomplishment can support disadvantaged and disaffected young people with gaining long term improvements in confidence and positive attitude.

Further reading can be found in the Sport England "Review of evidence on the outcomes of sport and physical activity; A rapid evidence review" from May 2017 [here](#).





1.4 Potential recommendations and considerations

For Public Health (PH)

For Drugs and Alcohol commissioners and services (DA)

For Stop Smoking commissioners and services (SS)

For Youth Offending Teams, VRUs or PRUs (VRU)

- 1) Consider how prioritising an increase in population level sport participation may lead to a reduction in crime. **(PH)**
- 2) Consider universal services that reduce sedentary behaviour in schools and its potential link to forming positive pro-social behaviour. **(PH)**
- 3) Consider how targeted physical activity and sport programmes can be used for children and young people (especially school age) to help reduce violent crime- Integrated as part of wider educational programmes with the appropriate staff and support mechanisms. **(PH, VRU)**
- 4) Street Games have also made a series of 7 localised recommendations of things to consider when setting up a programme looking at youth crime and sport **(PH, VRU)** click [here](#)

2.0 Sport, physical activity and drugs

There is fairly limited empirical evidence which looks at drug use and sport or physical activity. However, a systematic review of longitudinal studies in 2014 on 'Sport participation and alcohol and illicit drug use in adolescents and young adults' performed by Kwan M et al. [13] found that;

'Eighty percent of the studies found sport participation associated with decreased illicit drug use, while 50% of the studies found negative association between sport participation and marijuana use. Further investigation revealed that participation in sports reduced the risk of overall illicit drug use, but particularly during high school; suggesting that this may be a critical period to reduce or prevent the use of drugs through sport' (p506)

In addition to the systematic review there are 4 other studies worth noting:

- 1) A review of preclinical studies by Smith M A et al. [14] reported in the 'Frontiers Research Foundation' in 2011 found 'convincing evidence to support the development of exercise-based interventions to reduce compulsive patterns of drug intake in clinical and at-risk populations' (p82)
- 2) A 2015 review performed by Linke S E et al. [15] published in the 'American Journal of Drug and Alcohol Abuse' found that 'Despite the currently limited and inconsistent evidence, numerous theoretical and practical reasons support exercise-based treatments for SUDs (Substance Use Disorders), including psychological, behavioural, neurobiological, nearly universal safety profile, and overall positive health effects' (p.15)





- 3) A 2017 review published in the 'Current Addiction Reports' by Lynch W J et al. [16] found that 'Exercise is a promising prevention strategy for substance use disorder' (p.466)
- 4) Preliminary findings from a 2018 study by Ellingsen et al. [17] found that 'Football, circuit training and walking are feasible therapeutic activities for inpatients with poly-substance dependence' (p.789) but the study did state that further controlled trials were needed to evaluate long term outcomes.

2.1 Potential recommendations and considerations

- 1) Consider how structured physical activity programmes, especially in secondary schools, could help prevent and reduce illicit drug use. [13] **(PH, DA)**
- 2) Consider utilising exercise as a part of interventions that aim to reduce drug use – The potential to use exercise as part of the approach to reduce illicit behaviour and support wider health and wellbeing of those within current intervention programmes. [13] [14] [16] **(PH, DA)**
- 3) Consider commissioning further research to look at the potential protective nature of sport and physical activity with local drug support services at place. **(PH)**

3.0 Sport, physical activity and alcohol

There is limited empirical evidence which looks at alcohol use and sport or physical activity. A systematic review and meta-analysis performed in 2017 by Hallgren M et al. [18] entitled 'Exercise as treatment for alcohol use disorders' found that 'exercise appears not to reduce alcohol consumption, but has significant improvements in other health outcomes, including depression and physical fitness' (p.1064)

However, a research study not covered in the 2017 review which was produced later in 2017 by King K A et al. [19] found that 'Sports participation had a protective effect on alcohol use' (p.257) but that programs should employ a multifaceted approach including peers, school personnel, families, and community partners.

And a more recent cross-sectional study from Sampasa-Kanyinga H et al. [20] on movement guidelines and substance use amongst adolescents from 2021 found that meeting recommended physical activity levels is associated with 'lower odds of **alcohol consumption**, cannabis use, and cigarette smoking' (p.1)





3.1 Potential recommendations and considerations

- 1) Consider how sport and physical activity could form part of a multi-faceted approach to support alcohol services and alcohol use. [19] [20] **(PH, DA)**
- 2) Consider commissioning further research to look at the potential protective nature of sport and physical activity with local alcohol services at place. **(PH)**

4.0 Sport, physical activity and smoking

There is a plethora of research surrounding physical activity, sport and smoking. However, none coming to a definitive conclusion around whether physical activity as an independent factor predicts the likelihood of someone's chances of quitting smoking or long-term abstinence of smoking. Predominantly due to trial size, trial biases and lack of adherence to exercise programmes.

There have however been a range of systematic reviews that look at this topic.

- A systematic review in 2007 from Taylor A H [21] which specifically looked at exercise and its impact on withdrawal and cravings yielded positive results in that 'relatively small doses of exercise should be recommended as an aid to managing cigarette cravings and withdrawal symptoms' (p.540)
- However a further systematic review in 2019 from Ussher M H et al. [22] on 'Exercise interventions for smoking cessation' found that there insufficient evidence to recommend exercise as a specific aid to smoking cessation, but it did agree with the 2007 review that there is strong evidence to recommend exercise as an aid for reducing withdrawal and cravings.

A separate literature review performed by Linke, S et al in 2013 [23] focusing on smoking cessation in women, presented evidence that suggests that women are less likely to successfully quit smoking due, in part, to 'their tendency to smoke to help prevent or alleviate negative mood/affect, depression and/or post cessation weight gain' (p.19). This review summarised that the evidence suggests that acute bouts of exercise reduce cigarette cravings and withdrawal symptoms among temporarily abstinent smokers is strong but the evidence supporting the role of regular exercise in the context of smoking cessation treatment is relatively weak. One potential benefit of exercise could be to help 'alleviate women's fear of post cessation weight gain and reduces their cessation-related mood symptoms, making it a theoretically ideal smoking cessation intervention for women' (p.11).

A meta-analysis of Randomised Controlled Trials in 2017 from Klinsophon T et al. [24] found a 'positive effect on smoking cessation at the end of treatment in the program where yoga plus cognitive-behavioral therapy (CBT) was used' (p11)





There are also 2 other Randomised Controlled Trials that are worth noting:

- 1) A 2008 study from Prochaska J et al. [25] found that 'PA (*sic. Physical Activity*) promotion as an adjunct to tobacco treatment increases MVPA (Moderate to Vigorous Physical Activity) levels; changes in MVPA predict sustained abstinence, perhaps by improving mood and self-efficacy' (p.215). This research wasn't included in the 2019 systematic review due to the fact that the intervention included exercise counselling as part of a multiple-component relapse-prevention programme and it was therefore not possible to examine the specific effects of exercise.
- 2) In 2016 a study from Smits A J et al. [26] found that 'that exercise facilitates the odds of quit success for smokers with high levels of anxiety sensitivity and therefore may be a useful therapeutic tactic for this high-risk segment of the smoking population' (p. 355)

However, perhaps the most pertinent piece of research has yet to be performed; A new randomised controlled trial is currently underway by Taylor A et al. (2020) entitled 'Randomised controlled trial of tailored support to increase physical activity and reduce smoking in smokers not immediately ready to quit' This will be the first study to determine whether offering support to increase physical activity alongside smoking reduction is effective and cost-effective in increasing smoking abstinence among smokers not immediately ready to quit but who wish to reduce. It is expected that this study will report in 2022 and the results of which should be added to this paper.

4.1 Recommendations and considerations

- 1) Consider the role that physical activity might play in work aimed at supporting people in stopping smoking through reducing cravings and managing potential weight gain following quitting. [21][22][23] Exercise programmes should form part of wider counselling/behaviour change/CBT support of stop smoking programmes and must consider the impact of socio-economic status on proposed behaviour change. [24][26] **(PH, SS)**
- 2) Ensure any smoking cessation intervention incorporating exercise includes methods to increase adherence, such as pedometers, telephone check-ins and even financial incentives. [23] **(PH, SS)**
- 3) Consider commissioning further research to look at the potential protective nature of sport and physical activity with local Stop Smoking services. Any future research should also focus on increasing exercise adherence to help evaluate the efficacy of exercise [23], and should also consider the individuals prior/current physical activity levels, the amount of physical activity required to make an impact, and the overarching impact of socio-economic deprivation on behaviour change. **(PH)**

It is also worth noting the findings from the 2016 NCSCT (National Centre for Smoking Cessation and Training) report which states that in terms of multiple risk behaviour interventions, smoking should be targeted in isolation. Interventions that aim to increase physical activity AND help someone stop smoking are unlikely to be as effective or cost effective than single behaviour interventions. [27]





Finally, the decline in smoking rates has not been uniform across the social demographic, more than one in four routine and manual workers smoke, compared to only one in ten managerial and professional workers [28] and more than a third of those with a mental health condition smoke [29]. This has led to an acceleration of difference in health outcomes that is entirely predicted by level of social and economic deprivation. To ensure that actions to reduce prevalence do not widen these health inequalities, interventions aimed at reducing smoking must have a greater effect on those experiencing social or economic deprivation, than the most effective interventions do on the less deprived.

5.0 Interconnections

Although this report looks at the individual factors that sport and physical activity could potentially influence, it is important to note that many people will be linked to more than one of those factors. For example, someone currently within the criminal justice system is also more likely to have taken illicit substances [30]. Evidence also suggests that a child taking drugs at 16 also increases their chances of being a part of the criminal justice system as an adult [31]. Equally heavy drinkers tend to be heavy smokers [32] and that alcoholics who quit smoking are more likely to succeed in alcoholism treatment [32]. Therefore, it's important to look at the wider role that sport and physical activity could play across a range of behavioural interventions and not simply in silo. This is particularly important for public health and those involved in commissioning drugs and alcohol and stop smoking services. An additional overriding factor should also be considered, that of socio-economic deprivation. It is important to recognise that potential interventions should not widen pre-existing inequalities which are predominantly found in more deprived communities, in communities where capability is a driving factor for behaviour change.

Finally, one interconnected model that is worth noting is that of the '[Planet Youth- Icelandic model](#)'. [33] This model is an environmental approach in which parenting, parental supervision and organised leisure time activities, together with increased normative pressure play a central role in reducing smoking, alcohol and drug consumption among young people. This model which includes physical activity, along with a particularly strong alcohol policy is thought to have potentially contributed to the reduction in substance use in the country.

6.0 References

- [1] [HM Government \(2018\) Serious Violence Strategy](#).
- [2] Walpole, C, Mason, C, Case, S and Downward P, (2020), [Safer together through sport creating partnerships for positive change, literature review summary update, sport and serious youth violence](#), Loughborough university, Street Games and Derbyshire Police and Crime Commissioner.
- [3] Van der Kolk, B. A. (n.d) [Developmental trauma disorder: Towards a rational diagnosis for children with complex trauma histories](#). Retrieved on 12/1/2020
- [4] Skuse, T., & Matthew, J. (2014). [The Trauma Recovery Model](#) Retrieved on 12/1/2020
- [5] Big Lottery Fund. (2018). [Preventing serious youth violence: What works? Insights](#) and examples from the community and voluntary sector.





- [6] Mason, C, Walpole C and Case S (2020) [A Theory of Change; sing sport to enhance positive outcomes for young people in the context of serious youth violence.](#)
- [7] Brosnan, S. (2020). [The impact of sports participation on crime in England between 2012 and 2015.](#) Sport in Society 23(6) 1080-1090.
- [8] Chaput JP (2020), 2020 [WHO guidelines on physical activity and sedentary behaviour for children and adolescents aged 5–17 years:](#) summary of the evidence; World Health Organisation
- [9] Gebo, E. (2016) [An integrated public health and criminal justice approach to groups. What can research tell us?](#) Preventive Medicine Reports, 4, 376-380.
- [10] Tkacz, J., Young-Hyman, D., Boyle, C. A., et al. (2008). [Aerobic exercise program reduces anger expression among overweight children.](#) Pediatric Exercise Science 20(4) 390-401.
- [11] Edwards, M. K., Rhodes, R. E. & Loprinzi, P. D. (2017). [A Randomized Control Intervention Investigating the Effects of Acute Exercise on Emotional Regulation.](#) American Journal of Health Behavior 41(5) 534-543.
- [12] Nichols, G (2008) [Sport and Crime Reduction: The Role of Sports in Tackling Youth Crime.](#) The Howard journal of crime and justice, 47(5) p562-563
- [13] Kwan, M., Bobko, S., Faulkner, G., et al. (2014). [Sport participation and alcohol and illicit drug use in adolescents and young adults: a systematic review of longitudinal studies.](#) Addictive Behaviours 39(3) 497-506.
- [14] Smith, M. A. & Lynch, W. J. 2011. [Exercise as a potential treatment for drug abuse: evidence from preclinical studies.](#) Frontiers in psychiatry Frontiers Research Foundation 2 82.
- [15] Linke, S. E. & Ussher, M. (2015). [Exercise-based treatments for substance use disorders: evidence, theory, and practicality.](#) American Journal of Drug & Alcohol Abuse 41(1) 7-15.
- [16] Lynch, W. J., Robinson, A. M., Abel, J., et al. 2017. [Exercise as a Prevention for Substance Use Disorder: A Review of Sex Differences and Neurobiological Mechanisms.](#) Current Addiction Reports 4(4) 455-466.
- [17] Elligsen, MM, Johannesen SL, Martinsen E, Hallgren M (2018) [Effects of acute exercise on drug craving, self-esteem, mood and affect in adults with poly-substance dependence: Feasibility and preliminary findings,](#) Drug and Alcohol review, 37 (6) p.789-793.
- [18] Hallgren, M., Vancampfort, D., Giesen, E. S., et al. (2017). [Exercise as treatment for alcohol use disorders: systematic review and meta-analysis.](#) British Journal of Sports Medicine 51(14) 1058-1064.
- [19] King, K. A., Merianos, A. L., Vidourek, R. A., et al. (2017). [Examining the Relationship Between School Sports Participation and Alcohol Use Among Middle School and High School Students.](#) Journal of Child & Adolescent Substance Abuse 26(4) 251-257.
- [20] Sampasa-Kanyinga, H., Colman, I., Goldfield, G. S., et al. 2021. [24-h Movement Guidelines and Substance Use among Adolescents: A School-Based Cross-Sectional Study.](#) International Journal of Environmental Research and Public Health 18(6) 14.
- [21] Taylor AH (2007) [The acute effects of exercise on cigarette cravings, withdrawal symptoms, affect and smoking behaviour: a systematic review,](#) Addiction, P534-543





- [22] Ussher, MH et al (2019) [Exercise interventions for smoking cessation; A Systematic review](#), Cochrane Database, CD002295.
- [23] Linke S et al, (2013) [Exercise-based smoking cessation interventions among women](#), Womens Health (London), P69-84
- [24] Klinsophon T, et al (2017), [Effect of exercise type on smoking cessation: a meta-analysis of randomized controlled trials](#), BMC Research notes, Article 442
- [25] Prochaska J et al (2008) [Physical Activity as a Strategy for Maintaining Tobacco Abstinence; A Randomized Trial](#), PMC, P215-220
- [26] Smits, J. A, et al. (2016) [The Efficacy of Vigorous-Intensity Exercise as an Aid to Smoking Cessation in Adults With High Anxiety Sensitivity: A Randomized Controlled Trial](#). Psychosomatic Medicine 78(3) 354-64.
- [27] Shahab, L (2016) [Integrated health behaviour \(lifestyle\) services: a review of the evidence](#), NCSCT.
- [28] Selbie D. [Turning the tide on tobacco: Smoking in England hits a new low](#). Public Health England. July 2018.
- [29] NHS Digital. [Adult Psychiatric Morbidity Survey](#). 2014.
- [30] Kanato, M (2008) [Drug use and health among prison inmates](#), Current Opinion in Psychiatry, May;21(3):252-4
- [31] White J, Bell S and Batty G, (2020), [Association of illicit drug use in adolescence with socioeconomic and criminal justice outcomes in adulthood: prospective findings from a UK national birth cohort](#), Journal of Epidemiology and Community Health, p705-709.
- [32] Shiffman, S & Balaban M, 1996. [Do drinking and smoking go together Do Drinking and Smoking Go Together? \(nih.gov\)?](#), Alcohol Health Res World, p107-110.
- [33] Sigfúsdóttir ID et al (2008) [Substance use prevention for adolescents: the Icelandic Model](#), Health promotion international, volume 24, P.16-25

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