

Substance Abuse Programs that Reduce Violence in a Youth Population: A Systematic Review

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Abstract

The systematic review undertaken for this MPH dissertation examines the existing evidence for youth violence interventions involving substance abuse intervention programs.

Part A is the review protocol which outlines the background and process of the review. Search strategies combined related terms for youth, violence and a broad combination of terms for the intervention. Inclusion criteria were broad enough to include a wide range of study designs, given the large heterogeneity of outcomes and the paucity of randomised controlled trials (RCTs). Abstracts were screened by two reviewers, as were selected full texts articles. These were evaluated using the EPHPP questionnaire, a quantitative study assessment tool to identify methodological issues.

Part B elaborates on the background to the systematic review by exploring the existing theoretical and empirical literature around the topic. It describes prevalence and distribution of youth violence, the importance of youth violence as a public health problem and opportunities for prevention. It provides examples of different types of interventions, explores different mechanisms through which interventions may work and then provides an overview of the types of interventions covered by the proposed systematic review, including the theoretical background and selected examples.

Part C presents the full systematic review in a format suitable for journal submission. The background and process of the review is summarised and the results are presented and discussed.

Preamble

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Preamble

**Substance Abuse Programs that Reduce
Violence in a Youth Population: A
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Protocol**

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Substance Abuse Programs that Reduce Violence in a Youth Population: A Systematic Review

Background

Youth violence is an emerging priority area in global public health. Interpersonal violence is among the top three causes of death in youths, particularly in young men.

Globally, it is estimated that 1.6 million people died from violence in the year 2000, which corresponds to 28.8 per 100 000 population (Krug, Dahlberg, Mercy, Zwi, & Lozano, 2002).

Adolescents and young adults are the main victims and perpetrators of violence with homicide and non-fatal assaults involving young people contributing greatly to the global burden of premature death, injury and disability. (Krug, Mercy, Dahlberg, & Zwi, 2002)

In 2000, an estimated 199 000 youth homicides (9.2 per 100 000 population) occurred globally with homicide rates vary considerably by region, ranging from 0.9 per 100 000 in the high-income countries of Europe and parts of Asia and the Pacific, to 17.6 per 100 000 in Africa and 36.4 per 100 000 in Latin America (Krug, Mercy, et al., 2002)

Most of the countries with youth homicide rates above 10.0 per 100 000 are either developing countries or those experiencing rapid social and economic changes, whilst countries with the lowest rates of youth homicide are found predominantly in Western Europe, for example, France (0.6 per 100 000), Germany (0.8 per 100 000), and the United Kingdom (0.9 per 100 000); or in Asia, such as Japan (0.4 per 100 000). (Krug, Dahlberg, et al., 2002)

More than 90% of global deaths from injuries occur in low- and middle-income countries (World Health Organisation, 2002). Males in Africa and the low- and

middle-income countries of Europe, and females in Africa and India, have the highest injury-related mortality rates worldwide (World Health Organisation, 2002).

South Africa is a developing country with a history of legislated racial segregation which has given way to a constitutional based democracy. This was achieved by a half century of struggle for freedom in an environment of political violence and state-sponsored oppression. Political conflict has receded but high levels of interpersonal violence remain, heightened by rapid urbanization and continued socioeconomic disparities (Norman, Matzopoulos, Groenewald, & Bradshaw, 2007)

Of the estimated 59 935 injury deaths in 2000, 46% (27 563) were homicides (Norman et al., 2007). South Africa's homicide rates peaked in the male 15–29 age group at 184 per 100 000, nine times the global rate (Norman et al., 2007). Homicide rates for women peaked in the 30–44 age group at 31.7 per 100 000 which while much lower than for men, this was seven times the global rate (Norman et al., 2007). Interestingly, homicide rates for children under five were equally high for girls and boys and more than twice the global average (Norman et al., 2007). Almost everywhere, youth homicide rates are substantially lower among females than among males, suggesting that being a male is a strong demographic risk factor. (Krug, Dahlberg, et al., 2002). The age-standardized homicide rate per 100 000 was estimated at 113.4 for males and 21 for females separately, and 64.8 overall, placing South Africa among the most violent countries in the world. (Norman et al., 2007).

Drugs and alcohol are major contributors with 52.9% of fatal (Harris, Van Niekerk, & Matzopoulos, 2001), and up to 73.4% of non-fatal (Plüddemann, Parry, Donson, & Sukhai, 2004) patients with interpersonal violence injuries in urban areas testing positive for alcohol in 2001. Illicit drug use is thus a significant risk factor in the perpetuation of violence and stands amenable to prevention.

Most existing reviews of the evidence and guidance on prevention of youth violence focus on well-resourced settings and are not accessible to low and middle income countries. Furthermore developing countries data collection systems are often weak, affecting the verification of changing violence levels.

Additionally little research has been conducted to demonstrate the integration of risk factor control when addressing youth violence. A previous review of youth violence prevention strategies, reported on the effectiveness of programs in addressing one or more risk factors for juvenile delinquency and violence, however the program efficacy in specifically preventing or reducing violent behaviour in youth was not addressed (Kellerman, Fuqua-Whitley, Rivara, 1998).

This review specifically focuses on violence as a primary outcome and investigates the effects of community and society-level substance abuse programmes on youth violence.

Description of the condition

The World Health Organisation defines violence as ‘the intentional use of physical force or power, threatened or actual, against oneself, another person, or against a group or community, that either results in or has a high likelihood of resulting in injury, death, psychological harm, maldevelopment or deprivation’ (World Health Organisation, 1996). The focus will be on acts of interpersonal violence with the exclusion of acts of self directed or collective violence.

Youth are defined, according to the World report on violence and health, as being between 10 and 29 years old (Krug, Mercy, et al., 2002).

For the purpose of this review, youth violence is thus defined as ‘the intentional use of physical force or power, threatened or actual, against another person, resulting in injury, death, psychological harm, maldevelopment or deprivation, perpetrated by or against young people aged 10-29 years.’

Interventions for youth violence

Multiple violence prevention programs have been developed and applied in different settings with variable degrees of success (Limbos et al., 2007). As there are few uniform standards for program evaluation, comprehensive evaluations of violence prevention programs are often deficient (Limbos et al., 2007). The Surgeon General’s report on youth violence sought to address this deficiency by promoting three standards for evaluating program effectiveness: rigorous experimental design,

evidence of significant deterrent effects, and replication of these effects at multiple sites or in clinical trials(US DHHS, 2001).

Butchart et al. maintain that violence prevention requires comprehensive intervention strategies involving all sectors of society including Government, NGOs and civil society, the general public and the private sector, to address core underlying causes and risk factors (Butchart, Phinney, Check, & Villaveces, 2004).

In the 2004 World report on violence and health, Butchart et al highlight several key strategies for promoting primary prevention (Krug et al., 2002). These are investing in the early development stages of childhood; increasing positive adult involvement in the monitoring and supervision of children and adolescents; strengthening communities, for example through reducing the availability of alcohol or improving childcare facilities; changing cultural norms in order to promote such positive norms as equality for women or respect for the elderly, and to challenge negative norms associating violent behaviour with masculinity, or racism, classism, and sexism; reducing income inequality; and improving the efficiency and resource base of the criminal justice and social welfare systems (Krug et al., 2002). Whilst these interventions are addressed to general violence as opposed to youth violence, several of the recommendations promote early intervention at the youth level.

Recent evidence has indicated that the reviewing of broader intervention categorisations are able to demonstrate the efficiencies of the different approaches. Limbos et al (2007) reviewed interventions for youth violence, categorising interventions as primary (targeting the general population), secondary (targeting those at risk) and tertiary (targeting those already involved in violence) (Limbos et al., 2007). The Limbos et al review sought to identify interventions effective in preventing youth violent behaviour, and commonalities of effective interventions, concluding that increasing effectiveness was reported as the level of intervention increased from primary to tertiary (Limbos et al., 2007). Substance abuse interventions may be primary, secondary or tertiary interventions; nevertheless for this study direct measures of violence are the primary outcome measure.

In a review of youth violence prevention strategies, Kellerman et al reported on the effectiveness of programs in addressing one or more risk factors for juvenile delinquency and violence(Kellerman, Fuqua-Whitley, Rivara, 1998). However, the effectiveness of programs in specifically preventing or reducing violent behaviour in youth was not addressed in the review by Kellerman et al(Limbos et al., 2007).

This systematic review examines the effectiveness of youth violence prevention interventions and differs from previous reviews first, by examining the effectiveness of interventions in specifically preventing both violent behaviour and substance abuse; second by performing a systematic review of the literature on youth violence and substance abuse using different inclusion and exclusion criteria that limited the review to the most current and scientifically rigorous research conducted and finally by using quantitative methods to summarise the evaluation evidence for these specific variables.

Substance abuse

Violence prevention and intervention depend largely on identifying risk and protective factors and determining when and where in the course of development they emerge. When considering the Ecological model (Figure 1 below) for understanding violence, substance abuse may be identified as a risk factor that may act and influence all levels of the model.

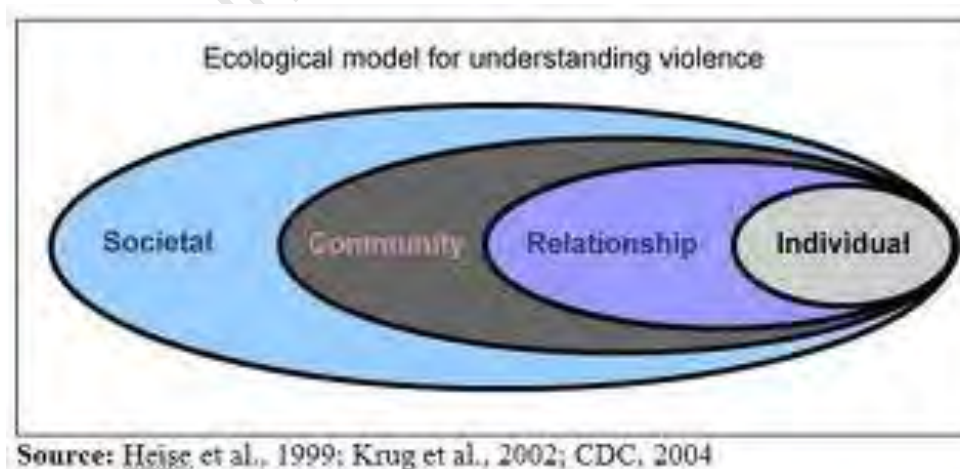


Figure 1. Ecological model for understanding violence (Krug, Dahlberg, et al., 2002)

The identification of substance abuse as a risk factor for youth violence will be a focus of the review. Within this examination we will briefly describe several mechanisms of how substance abuse increases risk for youth violence and later provide further description of the types of intervention to address this risk factor. Since the focus of this review is illicit drug abuse, alcohol and its relationship to violence will not be further described.

Research suggests a strong relationship between the use of illicit drugs and youth violence (NHSDA, 2001). The United States National Survey on Drug Use and Health (NSDUH) asks approximately 68 000 youths aged 12 to 17 to report on their involvement in violent behaviours during the 12 months before the survey (NHSDA, 2001). In this study Youths aged 12 to 17 who used an illicit drug in the past year were almost twice as likely to have engaged in a violent behaviour as those who did not use an illicit drug (49.8 vs. 26.6 percent). Furthermore the likelihood of having engaged in violent behaviour increased with the number of drugs used in the past year (i.e., 45.6 percent of youths who used 1 illicit drug engaged in violent behaviour compared to 61.9 percent of youths who used 3 or more illicit drugs) (NHSDA, 2001).

In terms of *relationships*, having friends who use drugs is associated with violence in young people (Thornberry, Huizinga, & Loeber, 1995). The results of studies in developed and developing countries found a correlation between violent behaviour and having friends who used drugs (Lipsey & Derzon, 1998) (Thornberry et al., 1995) (Perales & Sogi, 1995).

Community and *societal* influences play an integral role when considering the larger effects of substance abuse and youth violence. In Rio de Janeiro, Brazil, where the majority of victims and perpetrators of homicide are 25 years of age or younger, drug dealing is responsible for a large proportion of homicides, conflicts and injuries (De Souza Minayo, 1999). The presence of communal gangs and guns in conjunction with substance abuse is a potent mixture which increases the likelihood of violence (Krug, Dahlberg, et al., 2002). In several regions of Latin America and the Caribbean, youth

gangs involved in drug trafficking display higher levels of violence than those that are not (Rodgers, 1999).

Two South African studies describe substance abuse recorded in violent criminal cases. One study showed self reported cannabis use at between 22% and 28% amongst arrestees who committed violent offenses (Taylor et al., 2003) whilst another study conducted across 3 South African provinces confirmed drug usage amongst 45% of the alleged perpetrators via urinalysis testing (Parry, Plüddemann, Louw, & T, 2004).

There are a number of science based substance abuse prevention programs that can be used as a comprehensive approach to this risk factor for youth violence. We will conclude with the description of types of interventions for prevention programs. This will provide further understanding to the different approaches to substance prevention as well as offer a background to the programs included in this systematic review.

Description of the intervention

Types of interventions

Schools are appropriate settings for primary and secondary intervention programs. Beliefs and expectations about substance use are established as school aged children and adolescents; schools offer a systematic and efficient way of reaching a large part of the youth population and finally in most countries schools can enforce a broad spectrum of educational policies (Faggiano, Versino, Zambon, Borraccino, & Lemma, 2008).

As tertiary prevention targets youth already involved in violence, these interventions are normally run in juvenile centres, prisons or as a specialist program.

Primary prevention programs can be divided into those founded on (Tobler, 1986):

(1) Knowledge-only interventions, where description of biological, and psychological effects of drug use aims to build negative attitudes toward drugs and hence decrease their use.

(2) Affective-only e.g. self-esteem or self-awareness building interventions, based on the assumption that psychological factors place people at risk of use.

(3) Peer-based interventions, namely refusal skills and social life skills programs, the former focused on resistance skills or “say No” techniques or peer role models and the latter are on inter-personal skills (communication, modelling, etc) or intra-personal skills (affective education), both being founded on the assumption that peer pressure can lead to drug use.

(4) Knowledge plus affective interventions, in which knowledge is combined with affective education to provide values and build decision making patterns.

(5) Alternative approaches (activities & competence), such as interventions encouraging alternative activities(Hawkins & Al., 1998).

A 2008 systematic review of School-based prevention programs for illicit drugs use concluded that skill based primary prevention programs help to deter drug use however noted that more well designed, long-term randomised trials were needed and better evaluation of intervention components were required in future intervention and evaluation programs(Faggiano et al., 2008). This review seeks to identify in the literature, programs amenable to experimental design and in performing a cross program evaluation, to better understand intervention components and effective strategies.

Objectives

- To describe the scope and quality of existing literature on substance abuse intervention programs
- To accessibly present the existing evidence for various types of interventions
- To critique the existing evidence
- To discuss policy implications of evidence, including a reflection on the context, generalisability and feasibility of the included studies

Methods

Study Design

Systematic reviews are a key element of evidence-based healthcare. Randomised controlled trials (RCTs) are considered the gold standard for evidence however upstream interventions at the societal/community level are less amenable to experimental design. Thus this review includes evidence from a broader range of study designs. Study quality will be controlled by excluding designs where causality cannot be reasonably inferred.

The following study designs are included:

- Randomized-Controlled Trials
- Non-Randomized controlled trials
- Quasi-experimental designs
- Prospective and retrospective cohort studies

Participants

Participants for this study will include youth between the ages of 10-29 years old who are involved with substance abuse or illicit drug use, recreational drug use or trafficking.

Interventions

The following interventions will be included:

Interventions that address illicit drug use by perpetrators and whether these reduce violence.

Interventions that address the violence used as economic compulsive, violent crimes to access drugs (e.g. methadone programmes etc. if they are evaluated for violence)

Interventions that address violence inherent to illegal drug markets (gang activity etc).

Exclusion criteria

The following criteria will serve as exclusion for this study:

Participants may not have mental disorders

Date of publication pre 1990

Child abuse, elder abuse

Alcohol related violence and intervention programs

Type of control

No intervention

Type of outcome

Youth violence is defined as the intentional use of physical force or power, threatened or actual, against another person or against a group or community that results in or has a high likelihood of resulting in injury, death, psychological harm, maldevelopment, or deprivation" (Krug et al, 2002), including persons between the ages of 10 and 24.

Primary outcomes

Any outcome measurements that can accurately quantify a change in interpersonal violence following the completion of a relevant program.

E.g. Change (increase or decrease) in levels of assault, homicide, physical violence, aggression, bullying, delinquency, school violence, sexual violence, dangerous behaviour, externalising behaviour, violent crime.

Secondary outcomes

Dangerous and externalising behaviours

Dates

Only studies published from 1990 onwards will be considered for inclusion.

Search Strategy

A broad search of both academic databases and grey literature will be conducted. Although the primary language of many of the databases is English, studies will not be excluded based on language. Search strategies will combine related terms for youth, violence (including aggression, crime, homicide, and assault) and substance abuse intervention programs. A broad combination of terms will be used for the intervention, including terms related to drug dependence, illicit drug markets and drug related violence. The full list of search terms for all databases can be found in Appendix 1.

In keeping with the definition of youth of age range 10-29, studies that explicitly discuss other age categories, such as elder abuse and domestic abuse will be excluded.

Database searches

The following databases will be searched:

- Pubmed
- Sociological abstracts + IBSS + ERIC via Proquest
- PsycINFO + CINAHL + Humanities International via Ebscohost
- Embase
- Cochrane Collaboration
- Campbell Collaboration
- Social Care Online
- National Criminal Justice Reference Service
- Web of Knowledge
- Regional databases of the WHO

Other Sources

The following websites will be searched for relevant literature:

- Websites of WHO Violence Prevention Alliance (<http://www.who.int/violenceprevention/en/>)
- Blueprints for Violence Prevention (<http://www.colorado.edu/cspv/blueprints>)
- the Community Guide (<http://www.thecommunityguide.org/violence/index.html>)
- Centers for Disease Control and Prevention (<http://www.cdc.gov/ViolencePrevention/index.html>)
- The World Bank (www.worldbank.org)

Furthermore, the reference lists of all included studies will be checked for relevant literature once the screening of abstracts is complete.

Data collection and Analysis

Once all the search results have been imported to referencing software (Refworks), an initial screening of titles will be done to delete duplicates and any obviously irrelevant results. Then, based on the inclusion criteria outlined above, two reviewers will review all the abstracts and include all those which are potentially relevant. These results will then be compared and any disagreements will be resolved based on the full text. The full texts of the remaining eligible studies will then be reviewed to verify their suitability. Any disagreements at this stage will be resolved by discussion and advice from Richard Matzopoulos.

Data

Two reviewers will both assess all included studies using the EPHPP questionnaire, which is a quantitative study assessment tool to identify methodological issues (EPHPP, 2009). One reviewer will extract all relevant outcomes onto a data extraction form.

Assessment of Studies

The EPHPP tool has been demonstrated to have excellent overall consistency between different reviewers. This reflects a higher level of internal validity than the Cochrane Collaboration Risk of Bias tool. However, it should be noted that the two tools appear to measure different constructs. (Armijo-Olivo, Stiles et al. 2012). EPHPP assesses studies based on selection bias, study design, confounders, validity, blinding, data collection methods and loss to follow up (EPHPP, 2009). Because of the difficulty of complete blinding in studies of this sort, weak blinding was weighted less heavily towards the final assessment.

Data synthesis

Included studies will be summarised in tables to highlight the main existing evidence. A narrative summary of findings and a discussion section will present the included studies and draw conclusions.

Ethics

No formal ethical approval is required as we are using published or publicly available data.

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Appendix 1

Drug control interventions – Search terms

Pubmed: 300 results (also for use for EMBASE and Web of Knowledge platforms)

Filters used: since 1990-2012

(“drug control intervention*”[TIAB] OR “substance abuse*”[TIAB] OR “illicit drug use”[TIAB] OR “street drugs”[TIAB] OR “abused drugs”[TIAB] OR “recreational drug*”[TIAB] OR “drug dependence”[TIAB] OR “drug deal*”[TIAB] OR “drug prohibition”[TIAB] OR “drug legalisation”[TIAB] OR “drug legalization”[TIAB] OR “drug addict*”[TIAB] OR narcotic*[TIAB] OR “illicit drug market*”[TIAB] OR “violent drug cultures” [TIAB] OR “drug control”[TIAB] OR “ illicit drug trafficking” [TIAB] OR “deterrence of drug abuse”[TIAB] OR “ support programmes”[TIAB] OR “treatment programmes”[TIAB] OR “drug rehab*”[TIAB] OR “detox”[TIAB] OR “detoxification”[TIAB] OR "safe-injection"[TIAB] OR "needle exchange"[TIAB])

AND

(prevention[TIAB] OR preventing[TIAB] OR prevent[TIAB] OR reduction[TIAB] OR reduce[TIAB] OR decrease[TIAB] OR decreased[TIAB] OR decreasing[TIAB] OR decline[TIAB] OR declining[TIAB] OR control[TIAB] OR controlling[TIAB] OR impact [TIAB] OR effect[TIAB] OR effects[TIAB] OR affect[TIAB] OR affecting[TIAB] OR affects[TIAB] OR change[TIAB] OR changing[TIAB] OR changes[TIAB] OR intervene[TIAB] OR intervention*[TIAB])

AND

(“domestic abuse*”[TIAB] OR “physical abuse*”[TIAB] OR “partner abuse*”[TIAB] OR violent[TIAB] OR violence[TIAB] OR assault[TIAB] OR homicide[TIAB] OR gang[TIAB] OR gangs[TIAB] OR gang violence[TIAB] OR bully[TIAB] OR aggression[TIAB] OR aggressive[TIAB] OR robbery[TIAB] OR assault[TIAB] OR GBH[TIAB] OR contact crime[TIAB] OR interpersonal violence[TIAB])

AND

(youth[TIAB] OR adolescen*[TIAB] OR teenage*[TIAB] OR teen*[TIAB] OR juvenile*[TIAB] OR school*[TIAB] OR minors[TIAB])

Proquest (Sociological abstracts + IBBS + ERIC) : 550 results (peer reviewed : 134 results)

Ebscohost (Psycinfo + CINAHL + Humanities international) : 473 results (1990-2012), (peer reviewed 269)

(AB("drug control intervention*" OR "substance abuse*" OR "illicit drug use" OR "street drugs" OR "abused drugs" OR "recreational drug*" OR "drug dependence" OR "drug deal*" OR "drug prohibition" OR "drug legalisation" OR "drug legalization" OR "drug addict*" OR narcotic* OR "illicit drug market*" OR "violent drug cultures" OR "drug control" OR " illicit drug trafficking" OR "deterrence of drug abuse" OR " support programmes" OR "treatment programmes" OR "drug rehab*" OR "detox" OR "detoxification" OR "safe-injection" OR "needle exchange") OR TI("drug control intervention*" OR "substance abuse*" OR "illicit drug use" OR "street drugs" OR "abused drugs" OR "recreational drug*" OR "drug dependence" OR "drug deal*" OR "drug prohibition" OR "drug legalisation" OR "drug legalization" OR "drug addict*" OR narcotic* OR "illicit drug market*" OR "violent drug cultures" OR "drug control" OR " illicit drug trafficking" OR "deterrence of drug abuse" OR " support programmes" OR "treatment programmes" OR "drug rehab*" OR "detox" OR "detoxification" OR "safe-injection" OR "needle exchange"))

AND

(AB(prevention OR preventing OR prevent OR reduction OR reduce OR decrease OR decreased OR decreasing OR decline OR declining OR control OR controlling OR impact OR effect OR effects OR affect OR affecting OR affects OR change OR changing OR changes OR intervene OR intervention*) OR TI(prevention OR preventing OR prevent OR reduction OR reduce OR decrease OR decreased OR decreasing OR decline OR declining OR control OR controlling OR impact OR effect OR effects OR affect OR affecting OR affects OR change OR changing OR changes OR intervene OR intervention*))

AND

(AB("domestic abuse*" OR "physical abuse*" OR "partner abuse*" OR violent OR violence OR assault OR homicide OR gang OR gangs OR gang violence OR bully OR aggression OR aggressive OR robbery OR assault OR GBH OR contact crime OR interpersonal violence) OR TI("domestic abuse*" OR "physical abuse*" OR "partner abuse*" OR violent OR violence OR assault OR homicide OR gang OR gangs OR gang violence OR bully OR aggression OR aggressive OR robbery OR assault OR GBH OR contact crime OR interpersonal violence))

AND

(AB(youth OR adolescen* OR teenage* OR teen* OR juvenile* OR school* OR minors)
OR TI(youth OR adolescen* OR teenage* OR teen* OR juvenile* OR school* OR
minors))

Cochrane library: 264 results

(violent:ti,ab) OR (violence:ti,ab) AND (adolescents:ti,ab) OR (teenage:ti,ab) OR
(teenagers:ti,ab) OR (juvenile:ti,ab) AND (exp substance abuse:ti,ab) OR (school- based
intervention:,ti,ab) AND (prevention:ti,ab)

Social care online: 133 results

title="physical abuse* " or title=" partner abuse*" and title="violent " and title=" violence"
and title="assault " and title="homicide " and title=" youth" and title="adolescents " and
title="teenagers " and title="teens " and title="juveniles " and title="prevention " and title=""
intervention" and title="reduction " and title=" drug control intervention*" and title="exp
substance abuse* "

Campbell collaboration: 211 results

("drug control intervention*" OR "substance abuse*" OR "illicit drug use" OR "street
drugs" OR "abused drugs" OR "recreational drug*" OR "drug dependence" OR "drug deal*"
OR "drug prohibition" OR "drug legalisation" OR "drug legalization" OR "drug
addict*" OR narcotic* OR "illicit drug market*" OR "violent drug cultures" OR "drug
control" OR " illicit drug trafficking" OR "deterrence of drug abuse" OR " support
programmes" OR "treatment programmes" OR "drug rehab*" OR "detox" OR
"detoxification" OR "safe-injection" OR "needle exchange")

AND

(Prevention OR preventing OR prevent OR reduction OR reduce OR decrease OR
decreased OR decreasing OR decline OR declining OR control OR controlling OR
impact OR effect OR effects OR affect OR affecting OR affects OR change OR
changing OR changes OR intervene OR intervention*)

AND

("domestic abuse*" OR "physical abuse*" OR "partner abuse*" OR violent OR
violence OR assault OR homicide OR gang OR gangs OR gang violence OR bully
OR aggression OR aggressive OR robbery OR assault OR GBH OR contact crime
OR interpersonal violence)

AND

(youth OR adolescen* OR teenage* OR teen* OR juvenile* OR school* OR minors)

NCJRS: 145 results (abstracts)

"physical abuse" or " partner abuse" or "violent " or " violence" and "assault " or "homicide "
and " youth" or "adolescents " or "teenagers " or "teens " or "juveniles " and "prevention " or
" intervention" or "reduction " and " drug control intervention*" or "exp substance abuse* "

Regional databases

Western Pacific

WPRIM: 107 results

Filters used: 1990-2012, child 6-12, adolescent 13-18, human

"physical abuse" or " partner abuse" or "violent " or " violence" or "assault " or "homicide "
and " youth" or "adolescents " or "teenagers " or "teens " or "juveniles " and "prevention " or
" intervention" or "reduction " and " drug control intervention*" or "exp substance abuse* "
or "health education " or "counselling"

Eastern Mediterranean

IMEMR: 33 results

No filters used, keyword search

(physical abuse or partner abuse or violent or violence or assault or homicide or crime or
gang or bully or aggression or aggressive)

and

(youth or adolescents or teenagers or teens or juveniles or minor or child or children or
childhood)

and

(prevention or intervention or reduction or drug control intervention or exp substance abuse
or health education or counselling or street drugs or illicit drugs or recreational drugs or drug
dealing or drug prohibition or drug legalization or drug addiction)

South East Asia

IMSEAR: 0 results

(physical abuse or partner abuse or violent or violence or assault or homicide or crime or gang or bully or aggression or aggressive)

and

(youth or adolescents or teenagers or teens or juveniles or minor or child or children or childhood)

and

(prevention or intervention or reduction or drug control intervention or exp substance abuse or health education or counselling or street drugs or illicit drugs or recreational drugs or drug dealing or drug prohibition or drug legalization or drug addiction or marijuana or cannabis or hashish or ecstasy or cocaine or crack cocaine or hallucinogen or MDMA or heroin or health education or counselling)

Latin America and the Caribbean

VHL: 1 result

All indexes, all sources

(physical abuse or partner abuse or violent or violence or assault or homicide or crime or gang or bully or aggression or aggressive)

and

(youth or adolescents or teenagers or teens or juveniles or minor or child or children or childhood)

and

(prevention or intervention or reduction or drug control intervention or exp substance abuse or health education or counselling or street drugs or illicit drugs or recreational drugs or drug dealing or drug prohibition or drug legalization or drug addiction or marijuana or cannabis or hashish or ecstasy or cocaine or crack cocaine or hallucinogen or MDMA or heroin or health education or counselling)

Africa: 3 results

<http://indexmedicus.afro.who.int/cgi-bin/wxis.exe/iah/?IsisScript=iah/iah.xis&lang=I&base=AIM>

(physical abuse or partner abuse or violent or violence or assault or homicide or crime or gang or bully or aggression or aggressive)

and

(youth or adolescents or teenagers or teens or juveniles or minor or child or children or childhood)

and

(drug control intervention or exp substance abuse or health education or counselling or street drugs or illicit drugs or recreational drugs or drug dealing or drug prohibition or drug legalization or drug addiction or marijuana or cannabis or hashish or ecstasy or cocaine or crack cocaine or hallucinogen or MDMA or heroin or health education or counselling)

and

(prevention or preventing or prevent or intervention or reduction or reduce or decrease or decreasing or decreased or decline or declining or drop or fewer or fall or less or control or controlling or impact or effect or effects or affect or change or changing or changes or intervene)

Websites

WHO Violence Prevention Alliance (<http://www.who.int/violenceprevention/en/>)

Scanned topics of violence, adolescent health and substance abuse health.

1 relevant resource: http://whqlibdoc.who.int/publications/2009/9789241597838_eng.pdf

Blueprints for Violence Prevention (<http://www.colorado.edu/cspv/blueprints/>)

Reviewed injury, violence and safety. No relevant resources

Community Guide (<http://www.thecommunityguide.org/violence/index.html>)

No relevant resources under child care resources or crime statistics

Centers for Disease Control and Prevention
(<http://www.cdc.gov/ViolencePrevention/index.html>)

Reviewed sexual violence and adverse childhood experiences, no relevant resources

World Bank (www.worldbank.org)

0 results

University of Cape Town

Part B: Literature review

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Introduction

This literature review focuses on youth violence and substance abuse interventions. Definitions of 'youth' and 'violence' are described along with global prevalence and distribution of youth violence. Furthermore youth violence as a public health issue is examined. The review concludes with a description of types of interventions incorporated in the review including mechanisms linking interpersonal violence and illicit drugs; and developing world examples of intervention programs.

Definitions

For this review, violence was defined as 'the intentional use of physical force or power, threatened or actual, against oneself, another person, or against a group or community, that either results in or has a high likelihood of resulting in injury, death, psychological harm, maldevelopment or deprivation' (World Health Organisation, 1996). The focus will be on acts of interpersonal violence with the exclusion of acts of self directed or collective violence.

Youth are defined, according to the World report on violence and health, as being between 10 and 29 years old. (Krug, Mercy, Dahlberg, & Zwi, 2002).

Prevalence and distribution

Globally, it is estimated that 1.6 million people died from violence in the year 2000, which corresponds to 28.8 per 100 000 population (Krug, Dahlberg, Mercy, Zwi, & Lozano, 2002).

Adolescents and young adults are the main victims and perpetrators of violence with homicide and non-fatal assaults involving young people contributing greatly to the global burden of premature death, injury and disability. (Krug, Mercy, et al., 2002)

FIGURE 2.1
Estimated homicide rates among youths aged 10–29 years, 2000^a

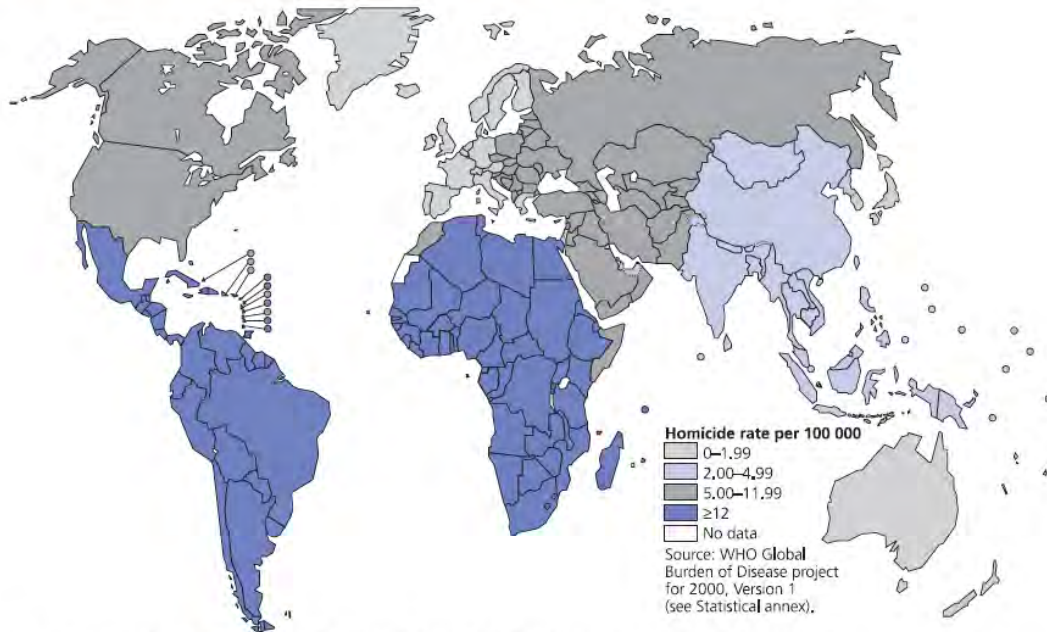


Figure 1. Estimated homicide rates among youths aged 10 – 29 years, 2000 (Krug, Dahlberg, et al., 2002)

In 2000, an estimated 199 000 youth homicides (9.2 per 100 000 population) occurred globally with homicide rates vary considerably by region, ranging from 0.9 per 100 000 in the high-income countries of Europe and parts of Asia and the Pacific, to 17.6 per 100 000 in Africa and 36.4 per 100 000 in Latin America (Krug, Mercy, et al., 2002)

Most of the countries with youth homicide rates above 10.0 per 100 000 are either developing countries or those experiencing rapid social and economic changes (Figure 1 above), whilst countries with the lowest rates of youth homicide are found predominantly in Western Europe, for example, France (0.6 per 100 000), Germany (0.8 per 100 000), and the United Kingdom (0.9 per 100 000); or in Asia, such as Japan (0.4 per 100 000). (Krug, Dahlberg, et al., 2002)

Almost everywhere, youth homicide rates are substantially lower among females than among males, suggesting that being a male is a strong demographic risk factor. (Krug, Dahlberg, et al., 2002)

Drug-related deaths account for between 0.5 per cent and 1.3 per cent of all-cause mortality at the global level among persons aged 15-64(United Nations Office on Drugs and Crime, 2012), however there is a considerable variation amongst regions. Table 2 below describes the regional variability of drug-related deaths.

Region	Number of all drug users (thousands)	Prevalence (percentage)	Number of drug-related deaths	Mortality rate per million aged 15-64
Africa	22,000-72,000	3.8-12.5	13,000-41,700	22.9-73.5
North America	45,000-46,000	14.7-15.1	44,800	147.3
South America	10,000-13,000	3.2-4.2	3,800-9,700	12.2-31.1
Asia	38,000-127,000	1.4-4.6	14,900-133,700	5.4-48.6
Europe	36,000-37,000	6.4-6.8	19,900	35.8
Oceania	3,000-5,000	12.3-20.1	3,000	123.0
Global	153,000-300,000	3.4-6.6	99,000-253,000	22.0-55.9

Table 2. Number of drug-related deaths Mortality rate per million population aged 15-64 (United Nations Office on Drugs and Crime, 2012)

Violence as a Public Health issue

In 1949, Gordon called for injury prevention efforts to be based on the understanding of causes, in a way that similar to the design of prevention efforts developed for communicable and other diseases (Gordon, 1949). In 1962, Gomez defined violence as an issue that public health experts needed to address stating that it should not be the primary domain of lawyers, military personnel or politicians(Abad Gomaz, 1962). A global effort to place violence on the public health agenda was reached in 1996 with the adoption of a resolution by the World health assembly declaring violence a major public health issue and calling for increased action(Krug, Mercy, et al., 2002).

Involvement of the public health sector in violence prevention infers several advantages. Public health complements existing reactive approaches to violence, by focusing on changing the behavioural, social and environmental contexts that give rise to violence(Mercy, Rosenberg, Powell, Broome, & Roper, 1993). Public health places a strong emphasis on

using scientific evidence to develop policies and have long standing commitments to supporting and aiding communities in developing solutions to their own health problems(Krug, Mercy, et al., 2002). This existing role may be extended to health services to reduce the duration of physical and psychological injuries of people injured in violent accidents, and include emergency response and trauma systems which are a critical health services component to violence prevention and management(Krug, Mercy, et al., 2002).

Risk factors

Violent behaviour is complex and is influenced by a combination of multiple factors(Atkinson et al., 2009). The ecological model for violence (see Figure 2 below) is a multi level model that addresses the factors that put people at risk for or protect them from experiencing or perpetrating violence (risk and protective factors) and the prevention strategies that can be used at each level to address these factors(Krug, Dahlberg, et al., 2002).

The WHO’s 2002 World Report on Violence and Health employs the Ecological model to identify four levels of risk for youth violence: biological and individual factors, relationships, community characteristics and broader societal factors.

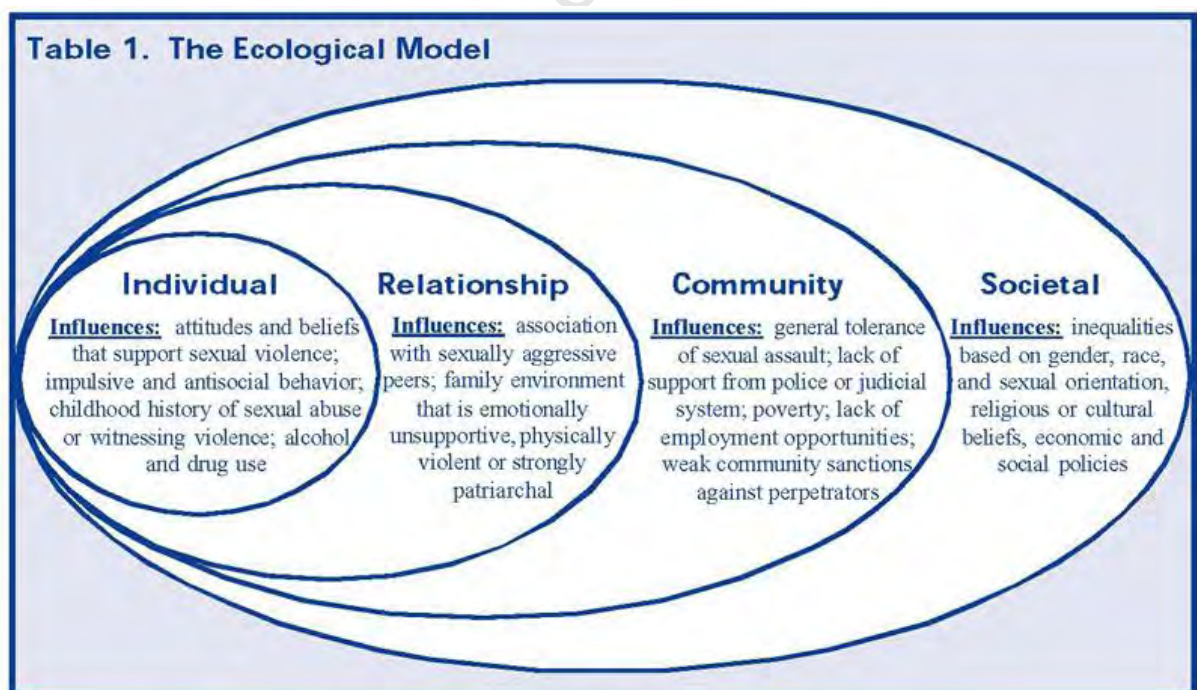


Figure 2. The Ecological model (Krug, Dahlberg, et al., 2002)

For the purpose of this review, age specific factors for the defined youth population, age 10-30, will be discussed further with examples provided for the respective categories. A brief focused description of the individual, relationship, community and societal arms of the model will follow, concluding with the influence of illicit drug use on the respective categories.

Individual

Individual and biological level factors that affect the potential for violent behaviour include biological, psychological and behavioural characteristics where these factors may appear in childhood or adolescence, and to varying degrees may be influenced by the person's family and peers and by other social and cultural factors (Krug, Dahlberg, et al., 2002).

Biological studies have also shown that abuse and neglect in childhood affects brain development and negatively influences cognitive, psychological and social adjustment increasing the risk for violent and anti-social behaviour (Raine, 2002).

Low heart rates in youth populations are associated with sensation-seeking and risk-taking, both characteristics that may predispose boys to aggression and violence (Raine, 1993). Furthermore mental and physical impairment also constitute important biological risk factors that may, predispose individuals to violent or aggressive behaviour (Matzopoulos, Bowman, Mathews, & Myers, 2010).

With regard to education, low intelligence and low levels of achievement in school have consistently been found to be associated with youth violence (Lipsey & Derzon, 1998). In the Philadelphia project, poor intelligence quotient (IQ) scores at the ages of 4 and 7 years in verbal and performance IQ tests, and low scores at 13–14 years in standard school achievement tests, all increased the likelihood of being arrested for violence up to the age of 22 years (Denno DW., 1990).

Relationship

In accordance with the ecological model, individual factors are often congruent with and influenced by interpersonal relationships. The influence of families is usually the greatest in

this respect during childhood, with adolescence friends and peers taking on greater importance with increasing age (Seguin et Al, 1995).

Parental behaviour and the family environment are central factors in the development of violent behaviour in young people with poor monitoring and supervision of children by parents and the use of harsh, physical punishment to discipline children shown to be strong predictors of violence during adolescence and adulthood(Krug, Mercy, et al., 2002). In her study of 250 boys in Boston, MA, United States, McCord found that poor parental supervision, parental aggression and harsh discipline at the age of 10 years strongly increased the risk of later convictions for violence up to 45 years of age(McCord, 1979).

In general, low socioeconomic status of the family is associated with future violence(Krug, Dahlberg, et al., 2002).

A study of young adults in Saõ Paulo, Brazil, found that, after adjusting for sex and age, the risk of being a victim of violence was significantly higher for youths from low socioeconomic classes compared with those from high socioeconomic classes(Gianini, Litvoc, & Neto, 1999). Similar results have been obtained from studies in Denmark (Hogh & Wolf, 1983), New Zealand (Henry & Al, 1996) and Sweden(Hawkins & Al., 1998).

Community

The presence of gangs, guns and drugs in a community are a potent mixture which increase the likelihood of violence(Krug, Dahlberg, et al., 2002). Gangs are associated with violent behaviour with studies having shown that as youths enter gangs they become more violent and engage in riskier, often illegal activities(Krug, Dahlberg, et al., 2002).

In a Pittsburgh study, initiation into dealing in drugs coincided with a significant increase in carrying weapons, with 80% of 19- year-olds who sold hard drugs (such as cocaine), also carrying a gun(Van Kammen & Loeber, 1994). In Rio de Janeiro, Brazil, where the majority of victims and perpetrators of homicide are 25 years of age or younger, drug dealing is

responsible for a large proportion of homicides, conflicts and injuries (De Souza Minayo, 1999). Higher levels of violence are found across Latin America and the Caribbean in youth gangs involved in drug trafficking display than those that are not (Rodgers, 1999).

Social capital is a concept that attempts to measure community integration with the degree of social integration within a community, also a factor affecting rates of youth violence (Krug, Dahlberg, et al., 2002). Social capital may be interpreted as the rules, norms, obligations, reciprocity and trust that exist in social relations and institutions (Lederman D, Loayza N, & AM, 1999).

Young people living in places that lack social capital perform poorly in school and are at greater risk of dropping out of school altogether (Ballard TJ et al., 1998). Furthermore Wilkinson et al showed that indices of social capital reflecting low social cohesion and high levels of interpersonal mistrust were linked with both higher homicide rates and greater economic inequality (Wilkinson RG, Kawachi I, & Kennedy BP, 1998).

Societal

Research has shown links between economic growth and violence, and between income inequality and violence (Messner SF, 1998). A study of 18 industrialized countries during the period 1950–1980, found that income inequality, as measured by the Gini coefficient, had a significant and positive effect on the homicide rate (Gartner, 1990). Fajnzylber et al obtained the same results in an investigation of 45 industrialized and developing countries between 1965 and 1995 (Fajnzylber P, Lederman D, & Loayza N, 1999).

Another cross national study drew similar conclusions namely, that income inequality was strongly linked with homicide rates, and that such rates also decreased as the per capita GDP increased (Unnithan NP & Whitt HP, 1992).

The quality of governance and political structures in a country, both in terms of the legal framework and the policies offering social protection, is an important determinant of violence (Krug, Dahlberg, et al., 2002). The extent to which a society enforces its existing

laws on violence, by arresting and prosecuting offenders, can have a deterrent effect on violence(Krug, Dahlberg, et al., 2002). Fajnzylber et al found that the arrest rate for homicides had a significant negative effect on the homicide rate(Fajnzylber P et al., 1999).

Governance can have a direct impact on violence affecting young people(Krug, Dahlberg, et al., 2002). In Rio de Janeiro, Brazil, a study found that the police were among the principal perpetrators of violence against young people with Police actions, particularly against young men from lower socioeconomic classes, involving physical violence, sexual abuse, rape and bribery(De Souza Minayo, 1999).

Lastly, a study of 21 countries over the period 1965–1988, found that spending on social insurance, as a proportion of the GDP, was negatively correlated with homicides of children up to 14 years of age(Briggs CM & P, 1994).

Mechanisms linking interpersonal violence and illicit drugs

Data from multiple sources, including studies from North America to South Africa, suggest a strong interrelationship between drug use and violence(US Department of Health and Human Services, 2001)(Elliot, Huizinga, & Menard, 1989)(Taylor et al., 2003)(Parry, Plüddemann, Louw, & T, 2004). Illicit drug use may involve participation in assault, homicide and other types of violent behaviour whilst individuals who are under the influence of alcohol or drugs may be involved in drug related criminal activity(Tardiff & Gross, 1986).

Although associations describing the multiple mechanisms linking interpersonal violence and illicit drug use are established, few studies have examined causal relationships(Atkinson et al., 2009). Different illicit drugs have varied effects on violence with some having a higher propensity for violence than others.(Atkinson et al., 2009).

We will now explore the gateway drug theory, concluding this section with theoretical mechanisms for the drug-violence relationship.

The Gateway or stepping stone theory suggests that the use of gateway drugs causes youths to have an increased risk of progressing to other more serious drugs(Morrall, McCaffrey, & Paddock, 2002). It is often attributed to three principal gateway drugs i.e. alcohol, tobacco and marijuana.

It is argued that proponents of the gateway theory invalidly infer a causal relationship between two variables (i.e. the relationship between the use of less harmful soft drugs and the use of more dangerous hard drugs) from a relationship between the two variables that is strictly correlational (Morral et al., 2002)(Fergusson & Horwood, 2000).

Three phenomena represent the primary evidence for a marijuana gateway effect(Morral et al., 2002). The first deals with the relative risk of hard drug *initiation* for an adolescent marijuana user vs non user; the second concerns the *ordering* in adolescents initiation of different drug groups and the third concerns the *frequency* of marijuana consumption and the risk of hard drug initiation(Morral et al., 2002).

These three phenomena does not adequately prove that the use of marijuana, rather than some associated factor, increases the risk of drug initiation (Joy, Watson, & Benson, 1999).

The common factor model is cited as an alternative explanation, stating that a common factor such as a propensity for drug use, could influence the use of both marijuana and hard drugs, thereby causing initiation of these drugs to be correlated(Hays, Widaman, DiMatteo, & Stacy, 1987)(MacCoun, 1998).

The common factor model notes the comprehensive scientific literature that takes into account the genetic, familial and environmental characteristics associated with a generalised risk of using both marijuana and hard drugs(Morral et al., 2002).

There exist several theoretical mechanisms for the drug-violence relationship which are further described below.

Drug use may be linked to violence at the direct *psychopharmacological* level where as a result of short- or long-term ingestion of specific substances, individuals may experience changes in physiological functioning that, in an unintoxicated state, would restrain behaviour.

Drug-related violence may also present as an *economic compulsive*, in that individuals addicted or dependent on illicit substances (e.g. cocaine and heroin) will commit crimes, including violent crimes, as a means to fund their drug use(Goldstein PJ., 1985)(Miczek KA et al., 1994)(Kuhns JB., 2005)

Finally, drug-related violence can be *systemic*, with violence being an inherent part of the illicit drug market. Violence is used to enforce the payment of debts, to resolve competition

between dealers, to punish informants and as a result of drug territory expansion(Kuhns JB., 2005)(Steinman KJ., 2005).

Interventions for youth violence

Multiple violence prevention programs have been developed and applied in different settings with variable degrees of success(Limbos et al., 2007). As there are few uniform standards for program evaluation, comprehensive evaluations of violence prevention programs are often deficient(Limbos et al., 2007). The Surgeon General's report on youth violence attempted to address this deficiency by promoting three standards for evaluating program effectiveness: rigorous experimental design, evidence of significant deterrent effects, and replication of these effects at multiple sites or in clinical trials(Surgeon General, 2001).

Butchart et al maintain that violence prevention requires comprehensive intervention strategies involving all sectors of society including Government, NGOs and civil society, the general public and the private sector, to address core underlying causes and risk factors (Butchart, Phinney, Check, & Villaveces, 2004).

In the 2002 World report on violence and health, Krug et al highlight several key strategies for promoting primary prevention (Krug et al., 2002). These are 'investing in the early development stages of childhood; increasing positive adult involvement in the monitoring and supervision of children and adolescents; strengthening communities, for example through reducing the availability of alcohol or improving childcare facilities; changing cultural norms in order to promote such positive norms as equality for women or respect for the elderly, and to challenge negative norms associating violent behaviour with masculinity, or racism, classism, and sexism; reducing income inequality; and improving the efficiency and resource base of the criminal justice and social welfare systems' (Krug et al., 2002). Whilst these interventions are addressed to general violence as opposed to youth violence, several of the recommendations promote early intervention at the youth level.

Recent evidence has indicated that the reviewing of broader intervention categorisations are able to demonstrate the efficiencies of the different approaches. Limbos et al (2007) reviewed interventions for youth violence, categorizing interventions as primary (targeting the general

population), secondary (targeting those at risk) and tertiary (targeting those already involved in violence) (Limbos et al., 2007). The Limbos et al review sought to identify interventions effective in preventing youth violent behaviour, and commonalities of effective interventions, concluding that increasing effectiveness was reported as the level of intervention increased from primary to tertiary (Limbos et al., 2007). Substance abuse interventions may be primary, secondary or tertiary interventions; nevertheless for this study direct measures of violence are the primary outcome measure.

In a review of youth violence prevention strategies, Kellerman et al reported on the effectiveness of programs in addressing one or more risk factors for juvenile delinquency and violence (Kellerman AL, Fuqua-Whitley DS, Rivara FP, 1998). However, the effectiveness of programs in specifically preventing or reducing violent behaviour in youth was not addressed in the review by Kellerman et al (Limbos et al., 2007).

This systematic review examines the effectiveness of youth violence prevention interventions and differs from previous reviews first, by examining the effectiveness of interventions in specifically preventing both violent behaviour and substance abuse; second by performing a systematic review of the literature on youth violence and substance abuse using different inclusion and exclusion criteria that limited the review to the most current and scientifically rigorous research conducted and finally by using quantitative methods to summarise the evaluation evidence for these specific variables.

Illicit drugs

Globally, there exists broad regional variations in illicit drug use (Table 1) (United Nations Office on Drugs and Crime, 2008). Cannabis is the most widely used drug internationally with rates of use varying from 2% of the population aged 15-64 in Asia to 15% in Oceania.

Region	Cannabis		Amphetamines		Ecstasy		Cocaine		Heroin	
	Number of users (thousands)	%	Number of users (thousands)	%	Number of users (thousands)	%	Number of users (thousands)	%	Number of users (thousands)	%
EUROPE	29,200	5.3	2,490	0.5	2,947	0.5	4,008	0.8	3,130	0.6
<i>Western/Central</i>	22,100	6.9	1,950	0.6	2,624	0.8	3,895	1.2	1,370	0.4
<i>South-East</i>	1,700	2.0	180	0.2	204	0.2	67	0.1	130	0.2
<i>Eastern</i>	5,400	3.7	350	0.2	117	0.1	46	0.0	1,630	1.1
AMERICAS	40,500	6.9	5,670	1.0	3,094	0.5	10,196	1.7	1,520	0.3
<i>North</i>	30,600	10.5	3,720	1.3	2,367	0.8	7,097	2.4	1,270	0.4
<i>South</i>	9,900	3.4	1,960	0.7	727	0.3	3,099	0.8	250	0.1
ASIA	51,100	2.0	13,750	0.5	2,103	0.1	335	0.0	6,080	0.2
OCEANIA	3,200	14.5	470	2.9	706	3.2	301	1.4	30	0.1
AFRICA	41,600	8.0	2,260	0.4	199	0.0	1,147	0.2	1,210	0.2
GLOBAL	165,600	3.9	24,650	0.6	9,047	0.2	15,987	0.4	11,970	0.3

Table 1: Global average estimates of use of selected illicit drugs by region, all people aged 15 to 64 years (2006) (United Nations Office on Drugs and Crime, 2008)

Illicit drugs influence all four arms of the ecological model for violence. We will briefly describe several mechanisms of influence and then focus on illicit drug use and its relationship to violence.

Drug use and dealing and type of drug use both influence individual level factors (Atkinson et al., 2009). Young people's drug use and initiation into drug dealing increases the risk of weapon carrying, and being a victim or perpetrator of violence (Lizotte AJ et al., 2003). Furthermore, within the illicit drug market violence is common place, with firearms specifically used by dealers, runners and users for protection, enforcement and punishment (Stretesky PB, 2007).

In terms of types of drugs used, a range of drugs, particularly cocaine and amphetamines (including methamphetamine) are associated with increased aggressive and violent behaviour (Hoaken PNS, 2003). Users of cocaine and/or heroin may be at greater risk of observing, perpetrating and being a victim of violence than cannabis users (Hoaken PNS, 2003). The non prescribed use of anabolic-androgenic steroids (AASs) is also associated with

a number of psychiatric and behavioural changes including aggression, which in some cases may lead to violence(Hoaken PNS, 2003).

Parental uses of drugs are an important relationship level factor for violence(Atkinson et al., 2009). The parental use of heroin and cocaine and the risk of child maltreatment, poor parenting and neglect have been documented(Kelley SJ., 1992). Parental drug use and the subsequent exposure of children to unsafe environments may increase their risk of being a victim of violence(Clark W et al., 2001). Increased levels of parenting stress and child maltreatment are associated with prenatal drug exposure (Kelley SJ., 1992).

Drug availability and nightlife environments are community level factors that influence violence(Atkinson et al., 2009). A high availability of drugs within communities is a risk factor for initiation into both drug use and violence(Yonas MA et al., 2007). Children exposed to drug trafficking are also at increased risk of delinquency including drug use and violence(Li X, Stanton B, 1999). Neighbourhood drug possession arrests have been found to be positively related to the rate of child maltreatment(Freisthler B, Needell H, 2005).

Social and economic inequality, discussed earlier, and a culture of violence and drug use are important societal level factors contributing to violence(Atkinson et al., 2009). A culture of violence, drugs and criminality increases the individual risk of using drugs and experiencing violence(Atkinson et al., 2009). Street children are at high risk of violence and illicit drug use as a result of the environment in which they live, for example in Rio de Janeiro almost half of street children report a history of physical abuse and illicit drug use and one third report belonging to a gang(Lusk MW., 1992). A Nigerian study of street children found that 25% operated as drug couriers, 14% abused drugs and almost a third had been arrested for street fighting and drug use(Olley BO., 2006).

Whilst illicit drug use alone is a risk factor for violence, many of the risk factors for drug use are also shared with those for involvement in violence which is further described in table 2 on page 16.

We will briefly describe several mechanisms of substance abuse and its relationship to violence. Since the focus of this review is illicit drug abuse, alcohol and its relationship to

Part B: Literature Review

violence will not be further described. Information on the use of illicit drugs and its relationship to violence is limited in comparison to alcohol. One of the contributing factors to this is that lack of routine drug testing during post mortem investigations (Matzopoulos et al., 2010).

Having friends who use drugs is associated with violence in young people (Thornberry, Huizinga, & Loeber, 1995). The results of studies in developed and developing countries found a correlation between violent behaviour and having friends who used drugs (Lipsey & Derzon, 1998) (Thornberry et al., 1995) (Perales & Sogi, 1995).

In Rio de Janeiro, Brazil, where the majority of victims and perpetrators of homicide are 25 years of age or younger, drug dealing is responsible for a large proportion of homicides, conflicts and injuries (De Souza Minayo, 1999).

The presence of gangs and guns in conjunction with substance abuse is a potent mixture which increases the likelihood of violence (Krug, Dahlberg, et al., 2002). In several regions of Latin America and the Caribbean, youth gangs involved in drug trafficking display higher levels of violence than those that are not (Rodgers, 1999).

Finally two South African studies describe substance abuse recorded in violent criminal cases. One study showed self reported cannabis use at between 22% and 28% amongst arrestees who committed violent offenses (Taylor et al., 2003) whilst another study conducted across 3 South African provinces confirmed drug usage amongst 45% of the alleged perpetrators via urinalysis testing (Parry et al., 2004).

The table below describes a summary of shared risk factors for illicit drug use and interpersonal violence.

Individual (microlevel)	Relationship (mesolevel)
<ul style="list-style-type: none"> • Stress/depression/anxiety • Personality and behavioural problems including impulsivity, hyperactivity, sensation seeking and attention problems 	<ul style="list-style-type: none"> • Parental substance abuse and deviance • Family interaction including low parental monitoring, poor supervision and discipline, family conflict, low parental expectations, parental rejection, low level of family cohesion
<ul style="list-style-type: none"> • Aggression • Mental health problems • Gender - males^c • Age - young people^d • Education and school performance including absence, truancy, lack of formal support and low educational aspirations 	<ul style="list-style-type: none"> • Family structure - single parents and divorce • Peer behaviour (e.g. drug using peers)
	Community and societal (macrolevel)
	<ul style="list-style-type: none"> • High drug availability • Low socio-economic status • Neighbourhood disorder

Table 2: Shared risk factors for illicit drug use and interpersonal violence(Kuhns JB., 2005)

Types of interventions

Schools are appropriate settings for primary and secondary intervention programs. Beliefs and expectations about substance use are established as school aged children and adolescents; schools offer a systematic and efficient way of reaching a large part of the youth population and finally in most countries schools can enforce a broad spectrum of educational policies(F Faggiano, Versino, Zambon, Borraccino, & Lemma, 2008).

As tertiary prevention targets youth already involved in violence, these interventions are normally run in juvenile centres, prisons or as a specialist program.

Programs can be divided into those founded on (Tobler, 1986):

(1) Knowledge-only interventions, where description of biological and psychological effects of drug use aims to build negative attitudes toward drugs and hence decrease their use.

(2) Affective-only e.g. self-esteem or self-awareness building interventions, based on the assumption that psychological factors place people at risk of use.

(3) Peer-based interventions, namely refusal skills and social life skills programs, the former focused on resistance skills or “say No” techniques or peer role models and the latter are on inter-personal skills (communication, modelling, etc) or intra-personal skills (affective education), both being founded on the assumption that peer pressure can lead to drug use.

(4) Knowledge plus affective interventions, in which knowledge is combined with affective education to provide values and build decision making patterns.

(5) Alternative approaches (activities & competence), such as interventions encouraging alternative activities(Hawkins & Al., 1998).

A 2008 systematic review of School-based prevention programs for illicit drugs use concluded that skill based programs help to deter drug use however noted that more well designed, long-term randomised trials were needed and better evaluation of intervention components were required in future intervention and evaluation programs(Fabrizio Faggiano et al., 2008).

Prevention science

The U.S. National Institute on Drug Abuse (NIDA), which conducts more than 85 percent of the world’s research on drug abuse, have through decades of research established core principles of drug prevention that strengthen prevention programs and increase effectiveness(National Institute on Drug Abuse, 2003). Several principles are described below:

- Prevention programs should enhance protective factors (e.g., parental monitoring, bonding, supporting and warm parenting, success in school, participation in extracurricular activities) and reduce risk factors (e.g., deviant peers, academic failure, a caregiver who is a substance

abuser, affectionless control, ready availability of drugs in community, and policies that normalise drug use).

- Prevention programs should be localised and community specific, addressing the actual problems and drugs threatening the community, the risk factors unique to the community, and strengthening the community's identified protective factors. However, the core elements of the research-based program must be retained.

- Prevention program elements should be tailored for the target audience (e.g. family-based prevention should enhance family bonding, and other parenting protective factors, while school-based prevention should provide youth with assertiveness, communication, and drug resistance skills).

- Prevention programs are most effective during key transition periods when youth are at most risk (e.g. transition from middle school to high school).

- Prevention programs implemented in multiple settings (e.g., in the school and home), for longer periods of time, with subsequent follow-up sessions, are most effective.

- Prevention programs implemented in the community across multiple settings (e.g., faith-based organisations, schools, and the media) should be consistent in messaging across settings. (National Institute on Drug Abuse, 2003)

Developing world examples

Healthwise

HealthWise is a comprehensive, risk-reduction life skills curriculum for adolescents, designed in collaboration between South African and North American researchers (University of the Western Cape and Pennsylvania State University), with overall goals of the HealthWise curriculum being to reduce the transmission of HIV/AIDS and other STIs and to reduce drug and alcohol abuse (Caldwell, Wegner, Mpofo, Flisher, & Mathews, 2004). The

curriculum consists of twelve lessons for Grade 8 learners, and six lessons for Grade 9 learners(Caldwell et al., 2004).

Although sexual behaviour is not an outcome for this study, the Healthwise curriculum do contain violence reduction modules wherein violence is a recognised study outcome.

In the analysis of all participants, frequent polydrug use was significantly lower among the HealthWise group(Tibbits, Smith, Caldwell, & Flisher, 2011). In the analysis of non-users at baseline, the HealthWise group had a significantly lower onset of frequent polydrug use than the comparison group ($P < 0.10$)(Tibbits et al., 2011). One of the most promising findings in this study was that the HealthWise curriculum was effective at slowing both the onset of frequent polydrug use among non-users at baseline and the increase in this outcome among the whole sample(Tibbits et al., 2011).

Some of the positive findings in this decade long study may be attributed to the identification of contextual needs of the study site, in this case being the high HIV prevalence and substance abuse in the Western Cape Province, and the resultant integration of programs (HIV, violence and substance abuse reduction) to develop a holistic skill based prevention program.

EUDAP (European drug addiction prevention trial) - Unplugged program

Unplugged is an innovative school program based on the Comprehensive social influence approach (Sussman et al., 2004)incorporating life skills elements, and is designed to delay or prevent the onset of substance misuse among junior high school students(Faggiano et al, 2010).

Unplugged is the first comprehensive social influence school curriculum in Europe of which the efficacy has been evaluated in a field trial, and it also constitutes an example of a theory- and evidence-based programme against youths' substance use(Faggiano et al, 2010). Due to the success of the interventions application in several European countries, the EUDAP model has subsequently been applied to several countries out of the European Union including the Middle East and North Africa.

The evaluation of the program based on the European study sites, indicated persistent positive effects over 18 months for alcohol abuse and for cannabis use, but not for cigarette smoking (Faggiano et al, 2010). Interestingly a gender difference was also noted in the Unplugged program evaluation which after further study using the Unplugged model concluded that comprehensive social influence school curricula against substance misuse in adolescence may perform differently among girls and boys, owing to developmental and personality factors (Sussman et al, 2004).

Conclusion

There are many complex variables that explain the interaction between substance abuse and youth violence with a multitude of programs available for the treatment of and prevention of substance abuse. The options are often guided by ideology and experience and not always by the best available evidence. Up to date, objective evidence must be made available to clinicians and policy actors to objectively judge the effectiveness of the varied interventions. Although there is a paucity of research in low and middle income countries, there is evidence to suggest that more collaborative efforts are underway to pilot and test interventions in these countries.

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Part C: Systematic review

Substance Abuse Programs that Reduce Violence in a Youth Population: A Systematic Review

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Abstract

Youth violence is an emerging priority area in global public health. Interpersonal violence is among the top three causes of death in youths, particularly in young men. The aim of this review was to elucidate whether community and society-level programmes for reducing exposure to illicit drug use, are more effective in preventing violence among young people aged 10-29 years than no intervention.

Methods and Findings

Fourteen databases were searched and supplemented by conducting the same keyword searches on the websites of the WHO library database (<http://www.who.int/library/databases/en/>), WHO Violence Prevention Alliance (<http://www.who.int/violenceprevention/en/>), Blueprints for Violence Prevention (<http://www.colorado.edu/cspv/blueprints/>), Community Guide (<http://www.thecommunityguide.org/violence/index.html>), Centers for Disease Control and Prevention (<http://www.cdc.gov/ViolencePrevention/index.html>) and the World Bank (www.worldbank.org). The search terms included studies in English published from 1 January 1990 through 30 June 2012.

Study quality was assessed using a validated quality assessment tool. Blind assessments of study eligibility and quality were conducted by two independent researchers to reduce bias, minimize errors, and enhance the reliability of findings. Disagreements were resolved by consensus amongst three authors.

Of the 471 potentially relevant unique citations from all literature searches, 5 studies involving a total of 6,361 youths met the inclusion criteria. Three out of the five studies were conducted in North America with one study taking place in Ireland and one in the United Kingdom. No studies were found for an intervention that address the violence used as economic compulsive, violent crimes to access drugs. Only one study was found of an intervention to address violence inherent to illegal drug markets. One study showed no overall effect for reducing violent behaviour. Three of the five studies (one of high and two of low quality) reported a statistical significant reduction in terms of their primary outcome, i.e. a change in levels of violence.

Conclusion

Evidence has been found to demonstrate that interventions showing a reduction in illicit drug use may also decrease violence. Interventions that address the economic impulsive to access drugs and reduce violence could not be assessed as these studies did not meet the inclusion criteria. The heterogeneous changing nature of the drug markets, offenders and overall neighbourhood contexts make it difficult to interpret the effect of the interventions on the systemic violence of drug markets.

Introduction

Youth violence is an emerging priority area in global public health. Violence involving young people, defined according to the World report on violence and health as being between 10 and 29 years old [1], contribute significantly to the cost of health and welfare services, decrease property value, reduce productivity and disrupt a range of essential services [2]. Interpersonal violence and illicit drug use are public health challenges that have strong links. Illicit drug use can increase the risks of being both a victim and/or perpetrator of violence. Risk factors at the individual, relationship, community and societal level have been identified that increase an individual's risk of experiencing violence related to illicit drug use.

There is a range of research globally to demonstrate the extent of drug related violence in specific populations and settings [3][4][5][6]. Adolescents and young adults are the main victims and perpetrators of violence, with homicide and non-fatal assaults involving young people contributing greatly to the global burden of premature death, injury and disability [1]. Interpersonal violence is among the top three causes of death in youths, particularly in young men with an estimated 199 000 youth homicides (9.2 per 100 000 population) occurring globally in the year 2000[2].

Previous reviews of the evidence and guidance on prevention of youth violence focus on well-resourced settings and are not accessible to low and middle income countries [7]. Additionally, data collection systems in developing countries are often weak, affecting the verification of changing violence levels [8]. Furthermore, little research has been conducted to demonstrate the integration of risk factor control when addressing youth violence. A previous review of youth violence prevention strategies reported on the effectiveness of programs in addressing one or more risk factors for juvenile delinquency and violence[9]; however, the effectiveness of the program in specifically preventing or reducing violent behaviour in youth was not addressed.

This review examines the effectiveness of youth violence prevention interventions and differs from previous reviews first, by performing a systematic review of the literature on youth violence and substance abuse using different inclusion and

exclusion criteria that limited this review to the most current and scientifically rigorous research conducted; second, by examining the effectiveness of interventions in specifically preventing both violent behaviour and substance abuse; and finally, by using quantitative methods to summarise the evaluation evidence for these specific variables.

Methods

Ethics Statement

All data used in this review were already in the public domain; no ethical approval was required.

Selection criteria

The systematic review protocol is available in Text S2. This review follows PRISMA reporting guidelines (for the PRISMA checklist, see Text S5) and was conducted as part of a larger set of systematic reviews for the World Health Organisation (WHO) for a special report on risk factors for Youth Violence.

All titles and abstracts found by the search strategy were filtered for relevance to the study objective. The full texts of potentially relevant articles were subject to the inclusion criteria listed in Text S4 to ensure they met minimum methodological standards. Qualitative studies were not included.

Studies were eligible for inclusion if they included: (1) youths (male or female) between the ages of 10-29 years old who self-identified, or were defined by researchers, as having been involved with illicit drug use and/or trafficking; (2) presented the results of peer-reviewed research based on either randomised controlled trials; non-randomized controlled trials; quasi-experimental design with baseline measures for outcome of interest; or prospective and retrospective cohort studies.

Studies were excluded if: (i) cases included participants with a psychiatric diagnosis (ii) the date of publication was before 1990. (iii) the violence was related to child abuse or elder abuse (iv) they reported Alcohol abuse intervention programs.

Search strategy

We searched for primary literature in fourteen major databases. The full search terms are described in Appendix A. The database search was supplemented by conducting the same keyword searches on the websites of the WHO library database (<http://www.who.int/library/databases/en/>), WHO Violence Prevention Alliance(<http://www.who.int/violenceprevention/en/>), Blueprints for Violence Prevention (<http://www.colorado.edu/cspv/blueprints/>), Community Guide (<http://www.thecommunityguide.org/violence/index.html>), Centers for Disease Control and Prevention (<http://www.cdc.gov/ViolencePrevention/index.html>) and the World Bank (www.worldbank.org). These electronic searches were supplemented by screening the reference lists of included papers and citation tracking. The search terms included studies in English published from 1 January 1990 through 30 June 2012.

Data extraction and analysis

A data extraction method was designed by two reviewers (A.J and A.L). A.J extracted the data using a preestablished standard data entry format into a database (Refworks). Disagreements between the two reviewers were resolved by consensus amongst three authors. The data synthesis was structured into four groups according to the five studies that met all the prescribed criteria (see Table S1 for summary of findings grade tables).

Results

Study Characteristics

The study selection process is shown in Text S1 as a PRISMA flow diagram. Of the 471 potentially relevant unique citations from all literature searches, five studies met the inclusion criteria. Key characteristics of the included studies are summarised in

Table S1. Three out of the four studies were conducted in North America with one study taking place in Ireland and one in the United Kingdom. All studies were published after 1990. Only one study was a randomised controlled trial.

Strengthening families program (Kumpfer *et al.*, 2012)

One of the limits at the outset of program for coverage is the involvement of high risk adolescents and their families for the 14 week intervention, with regards to concern for attrition and broader application to single working parent families. Factors limiting feasibility included the purchase of curriculum and costs to training group leaders (Estimated cost recommended by developer for cohort of 10 families range from \$5,000 to \$10,000)[10]. The core strength of program is the involvement of the family unit in the intervention. Subsequent pilots of the intervention with school teachers delivering the program and little emphasis on parental involvement revealed no significant effect on violence indicators[11], which limit the broader implementation of the program as a sole teacher led initiative within the school hours and school setting.

High point drug market intervention (Corsaro *et al.*, 2012)

This study constituted the only program of the five included studies that was an intervention to address violence inherent to illegal drug markets. The intervention has a specific application to disrupt high crime locations and to target repeat drug dealing offenders. Feasibility to the successful implementation of the program is limited due to the extensive nature of multi agency involvement which includes police, prosecution, probation and parole, social service providers and community leaders. The heterogeneous changing nature of the drug markets, offenders and overall neighbourhood contexts make it difficult to interpret the modest yet significant impact (reduction in number of violent incidents of 16.8% in Chronic High Trajectory group, $p = 0.031$)[12]. Inconsistent findings across pilot sites suggest that testing in other areas is warranted.

Brave program (Griffin *et al.*, 2009)

The program was applied to a school with a 99% African American population which limits the generalisability of the results. The intervention, whilst having a beneficial effect on participants frequency of alcohol and marijuana use ($p < 0.05$), had no effect on reducing violent behaviour[13].

Life skills training program (Botvin *et al.*, 2006)

The study had several notable strengths including a randomised control design, standardised collection procedures, analysis that controlled for intracluster correlation and a large sample size (4858 sixth grade students) relative to the other four included studies. The program is appropriate as a school based intervention, with delivery of the 15-part program by classroom teachers. Intervention material is limited to a teacher's manual with detailed lesson plans and student guides. The LST intervention is cost effective, with reasonable ease of implementation and coverage and evidence to suggest both reductions in illicit drug use (44% reduction in reported marijuana use compared to control group at 3 year follow up, $p < 0.01$)[14] and youth violence indicators (reduced frequent fighting in past year, $p < 0.03$)[16].

National treatment outcome research study (Gossop *et al.*, 2005)

The study's primary target population was heroin and opium addicts. Substantial reductions were noted in criminal convictions amongst the cohort of 1075 drug misusers after treatment for drug dependence problems. The most common types of convicted offenses were acquisitive crimes. However, the results of the study also showed reduction in conviction rates for violent crimes and offenses after treatment. A notable limitation was the absence of a control group, as well as treatment being voluntary and not coerced. Hser *et al* (2001) found that in a study of male heroin addicts admitted to a compulsory treatment program for criminal offenders, subjects showed relatively poor long term outcomes on a range of measures[15]. The intervention is (relative to the other programs) not cost effective, as it relies on an existing infrastructure of drug misuse treatment centres which house community and residential programs.

Discussion

Summary of Main findings

This review found only four studies that satisfied the criteria of an intervention that addressed illicit drug use by youth and whether these reduced violence. No studies were found for an intervention that addressed violence used as an economic compulsive or violence used to access drugs. Only one study was found of an intervention to address violence inherent to illegal drug markets [12]. Kumpfer et al demonstrated beneficial effect with regard to reducing youth violence but its replicability to larger cohorts was limited by cost, the training requirements for group leaders and the need for involvement of high risk adolescent and their families to reap a beneficial effect[10]. This study also represented a weak study design. The Griffin et al study showed no overall effect for reducing violent behaviour[13]. The Botvin et al study represented the strongest study design with beneficial effect demonstrated with violence indicators[14] and proved to be a cost effective and appropriate school based intervention.

Limitations of this review

Whilst there are an extensive number of substance abuse intervention programs globally, many of these programs are poorly designed, with few randomised controlled trials, difficulties in assessing intervention components and the lack of medium to long term follow up and evaluation of program participants. These factors limited the number of studies included in this review.

Of the five studies cited in this review, three are North American based whilst two are European based which reflects the scarcity of substance abuse prevention research being conducted in low and middle income countries and suggests a bias in the literature. The review also favours more downstream programmatic interventions as these are more conducive to evaluation research. For example, in the case of Kumpfer et al, the heterogeneous changing nature of the drug markets, offenders and overall neighbourhood contexts makes it difficult to attribute the modest yet significant impact to the intervention.

The restriction of this review to illicit drug use intervention programs meant that several intervention programs that addressed alcohol and illicit drug use control, could not be included. Only English studies were included, although the initial search strategy did not exclude non-English studies.

Implications

Our findings provided limited evidence to support the hypothesis that interventions that reduce illicit drug use in persons may also decrease violence. This is consistent with previous research which found that programs designed to address multiple risk factors for youth violence have shown efficacy [17]. Programs to strengthen families, enhance life skills training and provide drug abuse treatment, which aim to reduce illicit drug use have also been shown to decrease violence and achieve statistically significant reductions in violence and/or criminal behavior [18][19][10]. A recent Cochrane review found that skills based programs are effective in reducing illicit drug use however these findings were limited to primary and secondary intervention programs [20]. Tertiary prevention programs i.e. targeting those already involved in violence, are most effective when treating drug misusers substance dependence first and on a voluntary basis prior to any further intervention [18].

Our review suggests that schools are the most appropriate settings for primary (targeting the general population) and secondary (targeting those at risk) intervention programs. Knowledge, attitude and subsequent behaviour regarding illicit drug use are established as young children and adolescents with schools offering a base for broad implementation of substance abuse educational policies and offer a long period of follow up to assess program evaluation. In terms of cost and training, it would be cost-effective to have teachers and other dedicated staffs carry out the interventions as these are generally people who stay in the location over many years so the skills do not need to be retrained. Because of their daily interaction with youth there would also be a propensity for established trust.

Identification of risk factors in local settings is important in addressing contextual needs especially when introducing prevention programs in developing countries.

Integration of risk factors contextualised to local settings have shown efficacy as shown in the Healthwise life skill programs' reduction of high risk sexual behaviour and substance abuse amongst students in the Western Cape province of South Africa[17].

Public health professionals working with key stakeholder agencies have an important role in reducing drug related interpersonal violence. This includes conducting research describing the magnitude of the problem and identifying high risk groups; informing, developing, implementing and evaluating interventions to reduce drug-related violence and advocating for policy to reduce drug use and violence[21].

Conclusion

In the developing world, health priorities are often split into the burden of communicable and non communicable disease with substance abuse programs not recognised as a health priority. With increased urbanisation and changing social contexts, substance abuse plays a more expansive societal role affecting HIV transmission (through sharing of needles and risk taking sexual behaviour), mental health and violence being amongst the many negative social outcomes. Of the five studies cited by this review, three are North American based whilst two are European based which reflects the scarcity of substance abuse prevention research being conducted in low and middle income countries.

Drug-related interpersonal violence may have broad and substantial impacts which range from damaging the individual's health and the cohesion of communities to the drainage of resources from other priority health areas and services. Substance abuse and youth violence has become more important and widespread in rapidly urbanising lower and middle income countries. Despite a range of evidence suggesting links between illicit drugs and violent behaviour, there is a paucity of prevention interventions aimed at reducing violence that are specifically drug related. Further investment and research are required to evaluate the effects of co-ordinated and integrated programmes to prevent and treat both drug use and violent behaviour and to disseminate evidence based practice.

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Table S1 Grade Summary of Findings

Illicit drug control intervention programs that address youth violence				
Patient or population: participants involved in youth violence				
Settings: any				
Intervention: Drug (illicit) control				
Participants (studies)	Outcomes	Results	Quality of the evidence (GRADE) [EPHPP]	Intervention
178 eighth-grade students(Griffin 2009)[13]	Change in Aggressive Behaviour self-reported survey answers about frequency of aggression Follow-up: 1 year	Significant differences between the pre- and post-intervention values between the intervention and comparison groups were found for alcohol drinking and marijuana use	⊕⊕⊖⊖ low ³ [moderate]	Components of the BRAVE program included the development and monitoring of career goals, mentoring, peer-to-peer goal monitoring and reinforcement, vocational field trips, a vocational speakers' bureau, and case referral. The elements of the program were either designed to promote student motivation to acquire adaptive skills in the targeted behavioural areas or to enhance the generalisability of skills across settings.
4,858 sixth-grade students (Botvin 2006)[16]	Violence and Delinquency Surveys were used to assess violence and delinquent behaviour at baseline and post-intervention. Follow up : 1 year	Intervention reduced Delinquency, frequent fighting and frequent delinquency. Confounding still a possibility due to cluster design.	⊕⊕⊕⊕ high [moderate]	Students were taught a variety of cognitive-behavioural skills for problem-solving and decision-making, resisting media influences, managing stress and anxiety, communicating effectively, developing healthy personal relationships, and asserting one's rights. Students were taught the application of general assertiveness skills in situations in which they might experience direct interpersonal pressure to use drugs or act aggressively.

1,705 census house blocks (Corsaro 2012)[12]	Violence crime trends Incident data showing the variation in violent crime trend patterns across the 11-year measurement period (1998–2008) Follow-up: 11 years	Official incident data from the High Point Police Department between 1998 and 2008 .i.e violent crime incidents. The total number of violent crime events for the entire city were disaggregated to specific geographic contexts.	Moderate quality evidence	Researchers identified the high-density violent crime areas that were influenced by coterminous drug markets, identified key offenders within each site. Identified offenders were then arrested based on their violent criminal histories (felony convictions) or called-in to notification sessions. Thirdly, notified offenders completed a “needs assessment” the night of the call-in session, and they were subsequently assigned to local social service providers and community outreach officials for extensive follow-up.
250 high risk group and family (Kumpfer 2012)[10]	Reduction in substance abuse and criminality A “SFP Retrospective Parent Pre- and Post-test Questionnaire” was used with 20 outcomes measured. Duration- 4 months.	Statistically significant positive results. Larger effect sizes were found for the Irish families than the USA families. Overt and covert aggression, criminality and depression decreased more in Irish youth, but the USA youth improved more in social skills.	Low quality evidence	14 session SFP programme which is an evidence-based 7, 10 or 14-week family skills training program that involves the whole family in three classes run on the same night once a week.
1075 Clients (Gossop 2005)[18]	Changes in the rate of convictions Clinical data were collected using structured research interview administered at intake to treatment and follow-up, 1 yr, 2yr and 4-5 yrs after starting treatment.	Statistically significant positive results. Data showed reduced rates of convictions at 1yr, 2yrs and 5 years post intervention.	⊕⊕⊕⊖ low3	Treatment modalities from both residential and community treatment community settings. Residential modalities consisted of specialist in-patient programmes and Community modalities consisted of methadone maintenance and methadone reduction programmes.

GRADE Working Group grades of evidence

High quality: Further research is very unlikely to change our confidence in the estimate of effect.

Moderate quality: Further research is likely to have an important impact on our confidence in the estimate of effect and may change the estimate.

Low quality: Further research is very likely to have an important impact on our confidence in the estimate of effect and is likely to change the estimate.

Very low quality: We are very uncertain about the estimate.

³ Blinding and selection bias issues. Also, statistical analysis not very sophisticated.

⁶ Measures: Rape Myth Acceptance Scale (RMAS), Acceptance of Interpersonal Violence (AIV), Adversarial Sexual Beliefs Scale (ASBS), Rape Empathy Scale (RES) Attraction to Sexual Aggression Scale (ASAS) and Self-Efficacy Ratings (SER)

⁸ No effects shown, null hypothesis accepted. Many other possible explanations for results. For example, parallel campaigns in control state.

¹⁰ Undesirable effects of the perpetrator perspective video was a more favourable view of macho behaviour. Gender interactions also reported

¹² design very weak. No pre- post- comparison given, only comparison of exposed (self reported) and unexposed to baseline scores.

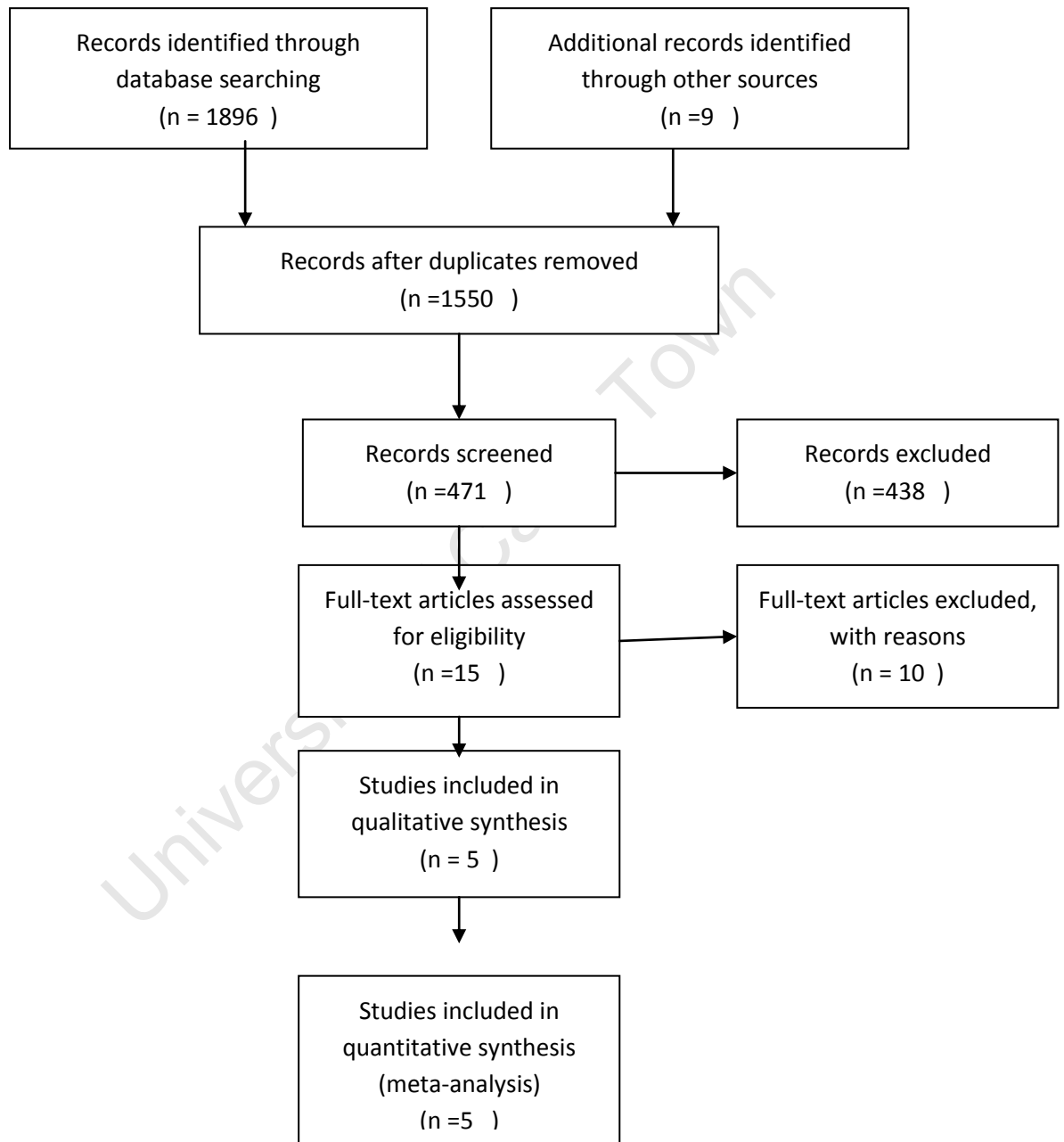
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Text S1 – PRISMA flow diagram

PRISMA Flow Diagram



Text S2 – Systematic review protocol

1. Title

Substance Abuse Programs that Reduce Violence in a Youth Population: A Systematic Review

2. Review team

Principal investigator: Dr Ardil Jabar

Reviewers: Aramide Lawal, Professor Richard Matzopoulos

3. Background

Youth violence is an emerging priority area in global public health. Violence involving young people, defined according to the World report on violence and health as being between 10 and 29 years old [1], contribute significantly to the cost of health and welfare services, decrease property value, reduce productivity and disrupt a range of essential services [2]. Interpersonal violence and illicit drug use are public health challenges that have strong links. Illicit drug use can increase the risks of being both a victim and/or perpetrator of violence. Risk factors at the individual, relationship, community and societal level have been identified that increase an individual's risk of experiencing violence related to illicit drug use.

There is a range of research globally to demonstrate the extent of drug related violence in specific populations and settings [3][4][5][6]. Adolescents and young adults are the main victims and perpetrators of violence, with homicide and non-fatal assaults involving young people contributing greatly to the global burden of premature death, injury and disability [1]. Interpersonal violence is among the top three causes of death in youths, particularly in young men with an estimated 199 000 youth homicides (9.2 per 100 000 population) occurring globally in the year 2000[2].

Previous reviews of the evidence and guidance on prevention of youth violence focus on well-resourced settings and are not accessible to low and middle income countries [7]. Additionally, data collection systems in developing countries are often weak, affecting the verification of changing violence levels [8]. Furthermore, little research has been conducted to demonstrate the integration of risk factor control when addressing youth violence. A previous review of youth violence prevention strategies reported on the effectiveness of programs in addressing one or more risk factors for juvenile delinquency and violence[9]; however, the effectiveness of the program in specifically preventing or reducing violent behaviour in youth was not addressed.

This review examines the effectiveness of youth violence prevention interventions and differs from previous reviews first, by performing a systematic review of the literature on youth violence and substance abuse using different inclusion and exclusion criteria that limited this review to the most current and scientifically rigorous research conducted; second, by examining the effectiveness of interventions

in specifically preventing both violent behaviour and substance abuse; and finally, by using quantitative methods to summarise the evaluation evidence for these specific variables.

4. Objectives

- To describe the scope and quality of existing literature on substance abuse intervention programs
- To accessibly present the existing evidence for various types of interventions
- To critique the existing evidence
- To discuss policy implications of evidence, including a reflection on the context, generalisability and feasibility of the included studies

5. Methods

Study Design

Systematic reviews are a key element of evidence-based healthcare. Randomised controlled trials (RCTs) are considered the gold standard for evidence however upstream interventions at the societal/community level are less amenable to experimental design. Thus this review includes evidence from a broader range of study designs. Study quality will be controlled by excluding designs where causality cannot be reasonably inferred.

The following study designs are included:

- Randomized-Controlled Trials
- Non-Randomized controlled trials
- Quasi-experimental designs
- Prospective and retrospective cohort studies

Participants

Participants for this study will include youth between the ages of 10-29 years old who are involved with substance abuse or illicit drug use, recreational drug use or trafficking.

Interventions

The following interventions will be included:

Interventions that address illicit drug use by perpetrators and whether these reduce violence.

Interventions that address the violence used as economic compulsive, violent crimes to access drugs (e.g. methadone programmes etc. if they are evaluated for violence)

Interventions that address violence inherent to illegal drug markets (gang activity etc).

Exclusion criteria

The following criteria will serve as exclusion for this study:

Participants may not have mental disorders

Date of publication pre 1990

Child abuse, elder abuse

Alcohol related violence and intervention programs

Type of control

No intervention

Type of outcome

Youth violence is defined as the intentional use of physical force or power, threatened or actual, against another person or against a group or community that results in or has a high likelihood of resulting in injury, death, psychological harm, maldevelopment, or deprivation" (Dahlberg and Krug 2002), including persons between the ages of 10 and 24.

Primary outcomes

Any outcome measurements that can accurately quantify a change in interpersonal violence following the completion of a relevant program.

E.g. Change (increase or decrease) in levels of assault, homicide, physical violence, aggression, bullying, delinquency, school violence, sexual violence, dangerous behaviour, externalising behaviour, violent crime.

Secondary outcomes

Dangerous and externalising behaviours

Dates

Only studies published from 1990 onwards will be considered for inclusion.

6. Search Strategy

A broad search of both academic databases and grey literature will be conducted. Although the primary language of many of the databases is English, studies will not be excluded based on language. Search strategies will combine related terms for youth, violence (including aggression, crime, homicide, and assault) and substance abuse intervention programs. A broad combination of terms will be used for the intervention, including terms related to drug dependence, illicit drug markets and drug related violence. The full list of search terms for all databases can be found in Appendix .

In keeping with the definition of youth of age range 10-29, studies that explicitly discuss other age categories, such as elder abuse and domestic abuse will be excluded.

Database searches

The following databases will be searched:

- Pubmed
- Sociological abstracts + IBSS + ERIC via Proquest
- PsycINFO + CINAHL + Humanities International via Ebscohost
- Embase
- Cochrane Collaboration
- Campbell Collaboration
- Social Care Online
- National Criminal Justice Reference Service
- Web of Knowledge
- Regional databases of the WHO

Other Sources

The following websites will be searched for relevant literature:

- Websites of WHO Violence Prevention Alliance (<http://www.who.int/violenceprevention/en/>)

- Blueprints for Violence Prevention (<http://www.colorado.edu/cspv/blueprints>)
- the Community Guide (<http://www.thecommunityguide.org/violence/index.html>)
- Centers for Disease Control and Prevention (<http://www.cdc.gov/ViolencePrevention/index.html>)
- The World Bank (www.worldbank.org)

Furthermore, the reference lists of all included studies will be checked for relevant literature once the screening of abstracts is complete.

7. Conducting the review

Data collection and Analysis

Once all the search results have been imported to referencing software (Refworks), an initial screening of titles will be done to delete duplicates and any obviously irrelevant results. Then, based on the inclusion criteria outlined above, two reviewers will review all the abstracts and include all those which are potentially relevant. These results will then be compared and any disagreements will be resolved based on the full text. The full texts of the the remaining eligible studies will then be reviewed to verify their suitability. Any disagreements at this stage will be resolved by discussion and advice from Richard Matzopoulos.

Data

Two reviewers will both assess all included studies using the EPHPP questionnaire, which is a quantitative study assessment tool to identify methodological issues (EPHPP, 2009). One reviewer will extract all relevant outcomes onto a data extraction form.

Assessment of Studies

The EPHPP tool has been demonstrated to have excellent overall consistency between different reviewers. This reflects a higher level of internal validity than the Cochrane Collaboration Risk of Bias tool. However, it should be noted that the two tools appear to measure different constructs. (Armijo-Olivo, Stiles et al. 2012). EPHPP assesses studies based on selection bias, study design, confounders, validity, blinding, data collection methods and loss to follow up (EPHPP 2009). Because of the difficulty of complete blinding in studies of this sort, weak blinding was weighted less heavily towards the final assessment.

Data synthesis

Included studies will be summarised in tables to highlight the main existing evidence. A narrative summary of findings and a discussion section will present the included studies and draw conclusions.

Ethics

No formal ethical approval is required as we are using published or publicly available data.

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Appendix A

Search terms for databases and websites

Pubmed: 300 results (also for use for EMBASE and Web of Knowledge platforms)

Filters used: since 1990-2012

(“drug control intervention*”[TIAB] OR “substance abuse*”[TIAB] OR “illicit drug use”[TIAB] OR “street drugs”[TIAB] OR “abused drugs”[TIAB] OR “recreational drug*”[TIAB] OR “drug dependence”[TIAB] OR “drug deal*”[TIAB] OR “drug prohibition”[TIAB] OR “drug legalisation”[TIAB] OR “drug legalization”[TIAB] OR “drug addict*”[TIAB] OR narcotic*[TIAB] OR “illicit drug market*”[TIAB] OR “violent drug cultures” [TIAB] OR “drug control”[TIAB] OR “ illicit drug trafficking” [TIAB] OR “deterrence of drug abuse”[TIAB] OR “ support programmes”[TIAB] OR “treatment programmes”[TIAB] OR “drug rehab*”[TIAB] OR “detox”[TIAB] OR “detoxification”[TIAB] OR "safe-injection"[TIAB] OR "needle exchange"[TIAB])

AND

(prevention[TIAB] OR preventing[TIAB] OR prevent[TIAB] OR reduction[TIAB] OR reduce[TIAB] OR decrease[TIAB] OR decreased[TIAB] OR decreasing[TIAB] OR decline[TIAB] OR declining[TIAB] OR control[TIAB] OR controlling[TIAB] OR impact [TIAB] OR effect[TIAB] OR effects[TIAB] OR affect[TIAB] OR affecting[TIAB] OR affects[TIAB] OR change[TIAB] OR changing[TIAB] OR changes[TIAB] OR intervene[TIAB] OR intervention*[TIAB])

AND

(“domestic abuse*”[TIAB] OR “physical abuse*”[TIAB] OR “partner abuse*”[TIAB] OR violent[TIAB] OR violence[TIAB] OR assault[TIAB] OR homicide[TIAB] OR gang[TIAB] OR gangs[TIAB] OR gang violence[TIAB] OR bully[TIAB] OR aggression[TIAB] OR aggressive[TIAB] OR robbery[TIAB] OR assault[TIAB] OR GBH[TIAB] OR contact crime[TIAB] OR interpersonal violence[TIAB])

AND

(youth[TIAB] OR adolescen*[TIAB] OR teenage*[TIAB] OR teen*[TIAB] OR juvenile*[TIAB] OR school*[TIAB] OR minors[TIAB])

Proquest (Sociological abstracts + IBBS + ERIC) : 550 results (peer reviewed : 134 results)

Ebscohost (Psycinfo + CINAHL + Humanities international) : 473 results (1990-2012), (peer reviewed 269)

(AB("drug control intervention*" OR "substance abuse*" OR "illicit drug use" OR "street drugs" OR "abused drugs" OR "recreational drug*" OR "drug dependence" OR "drug deal*" OR "drug prohibition" OR "drug legalisation" OR "drug legalization" OR "drug addict*" OR narcotic* OR "illicit drug market*" OR "violent drug cultures" OR "drug control" OR " illicit drug trafficking" OR "deterrence of drug abuse" OR " support programmes" OR "treatment programmes" OR "drug rehab*" OR "detox" OR "detoxification" OR "safe-injection" OR "needle exchange") OR TI("drug control intervention*" OR "substance abuse*" OR "illicit drug use" OR "street drugs" OR "abused drugs" OR "recreational drug*" OR "drug dependence" OR "drug deal*" OR "drug prohibition" OR "drug legalisation" OR "drug legalization" OR "drug addict*" OR narcotic* OR "illicit drug market*" OR "violent drug cultures" OR "drug control" OR " illicit drug trafficking" OR "deterrence of drug abuse" OR " support programmes" OR "treatment programmes" OR "drug rehab*" OR "detox" OR "detoxification" OR "safe-injection" OR "needle exchange"))

AND

(AB(prevention OR preventing OR prevent OR reduction OR reduce OR decrease OR decreased OR decreasing OR decline OR declining OR control OR controlling OR impact OR effect OR effects OR affect OR affecting OR affects OR change OR changing OR changes OR intervene OR intervention*) OR TI(prevention OR preventing OR prevent OR reduction OR reduce OR decrease OR decreased OR decreasing OR decline OR declining OR control OR controlling OR impact OR effect OR effects OR affect OR affecting OR affects OR change OR changing OR changes OR intervene OR intervention*))

AND

(AB("domestic abuse*" OR "physical abuse*" OR "partner abuse*" OR violent OR violence OR assault OR homicide OR gang OR gangs OR gang violence OR bully OR aggression OR aggressive OR robbery OR assault OR GBH OR contact crime OR interpersonal violence) OR TI("domestic abuse*" OR "physical abuse*" OR "partner abuse*" OR violent OR violence OR assault OR homicide OR gang OR gangs OR gang violence OR bully OR aggression OR aggressive OR robbery OR assault OR GBH OR contact crime OR interpersonal violence))

AND

(AB(youth OR adolescen* OR teenage* OR teen* OR juvenile* OR school* OR minors)
OR TI(youth OR adolescen* OR teenage* OR teen* OR juvenile* OR school* OR
minors))

Cochrane library: 264 results

(violent:ti,ab) OR (violence:ti,ab) AND (adolescents:ti,ab) OR (teenage:ti,ab) OR
(teenagers:ti,ab) OR (juvenile:ti,ab) AND (exp substance abuse:ti,ab) OR (school- based
intervention:ti,ab) AND (prevention:ti,ab)

Social care online: 133 results

title="physical abuse* " or title=" partner abuse*" and title="violent " and title=" violence"
and title="assault " and title="homicide " and title=" youth" and title="adolescents " and
title="teenagers " and title="teens " and title="juveniles " and title="prevention " and title=""
intervention" and title="reduction " and title=" drug control intervention*" and title="exp
substance abuse* "

Campbell collaboration: 211 results

("drug control intervention*" OR "substance abuse*" OR "illicit drug use" OR "street
drugs" OR "abused drugs" OR "recreational drug*" OR "drug dependence" OR "drug deal*"
OR "drug prohibition" OR "drug legalisation" OR "drug legalization" OR "drug
addict*" OR narcotic* OR "illicit drug market*" OR "violent drug cultures" OR "drug
control" OR " illicit drug trafficking" OR "deterrence of drug abuse" OR " support
programmes" OR "treatment programmes" OR "drug rehab*" OR "detox" OR
"detoxification" OR "safe-injection" OR "needle exchange")

AND

(Prevention OR preventing OR prevent OR reduction OR reduce OR decrease OR
decreased OR decreasing OR decline OR declining OR control OR controlling OR
impact OR effect OR effects OR affect OR affecting OR affects OR change OR
changing OR changes OR intervene OR intervention*)

AND

("domestic abuse*" OR "physical abuse*" OR "partner abuse*" OR violent OR
violence OR assault OR homicide OR gang OR gangs OR gang violence OR bully
OR aggression OR aggressive OR robbery OR assault OR GBH OR contact crime
OR interpersonal violence)

AND

(youth OR adolescen* OR teenage* OR teen* OR juvenile* OR school* OR minors)

NCJRS: 145 results (abstracts)

"physical abuse" or " partner abuse" or "violent " or " violence" and "assault " or "homicide "
and " youth" or "adolescents " or "teenagers " or "teens " or "juveniles " and "prevention " or
" intervention" or "reduction " and " drug control intervention*" or "exp substance abuse* "

Regional databases

Western Pacific

WPRIM: 107 results

Filters used: 1990-2012, child 6-12, adolescent 13-18, human

"physical abuse" or " partner abuse" or "violent " or " violence" or "assault " or "homicide "
and " youth" or "adolescents " or "teenagers " or "teens " or "juveniles " and "prevention " or
" intervention" or "reduction " and " drug control intervention*" or "exp substance abuse* "
or "health education " or "counselling"

Eastern Mediterranean

IMEMR: 33 results

No filters used, keyword search

(physical abuse or partner abuse or violent or violence or assault or homicide or crime or
gang or bully or aggression or aggressive)

and

(youth or adolescents or teenagers or teens or juveniles or minor or child or children or
childhood)

and

(prevention or intervention or reduction or drug control intervention or exp substance abuse
or health education or counselling or street drugs or illicit drugs or recreational drugs or drug
dealing or drug prohibition or drug legalization or drug addiction)

South East Asia

IMSEAR: 0 results

(physical abuse or partner abuse or violent or violence or assault or homicide or crime or
gang or bully or aggression or aggressive)

and

(youth or adolescents or teenagers or teens or juveniles or minor or child or children or childhood)

and

(prevention or intervention or reduction or drug control intervention or exp substance abuse or health education or counselling or street drugs or illicit drugs or recreational drugs or drug dealing or drug prohibition or drug legalization or drug addiction or marijuana or cannabis or hashish or ecstasy or cocaine or crack cocaine or hallucinogen or MDMA or heroin or health education or counselling)

Latin America and the Caribbean

VHL: 1 result

All indexes, all sources

(physical abuse or partner abuse or violent or violence or assault or homicide or crime or gang or bully or aggression or aggressive)

and

(youth or adolescents or teenagers or teens or juveniles or minor or child or children or childhood)

and

(prevention or intervention or reduction or drug control intervention or exp substance abuse or health education or counselling or street drugs or illicit drugs or recreational drugs or drug dealing or drug prohibition or drug legalization or drug addiction or marijuana or cannabis or hashish or ecstasy or cocaine or crack cocaine or hallucinogen or MDMA or heroin or health education or counselling)

Africa: 3 results

<http://indexmedicus.afro.who.int/cgi-bin/wxis.exe/iah/?IsisScript=iah/iah.xis&lang=I&base=AIM>

(physical abuse or partner abuse or violent or violence or assault or homicide or crime or gang or bully or aggression or aggressive)

and

(youth or adolescents or teenagers or teens or juveniles or minor or child or children or childhood)

and

(drug control intervention or exp substance abuse or health education or counselling or street drugs or illicit drugs or recreational drugs or drug dealing or drug prohibition or drug legalization or drug addiction or marijuana or cannabis or hashish or ecstasy or cocaine or crack cocaine or hallucinogen or MDMA or heroin or health education or counselling)

and

(prevention or preventing or prevent or intervention or reduction or reduce or decrease or decreasing or decreased or decline or declining or drop or fewer or fall or less or control or controlling or impact or effect or effects or affect or change or changing or changes or intervene)

Websites

WHO Violence Prevention Alliance (<http://www.who.int/violenceprevention/en/>)

Scanned topics of violence, adolescent health and substance abuse health.

1 relevant resource: http://whqlibdoc.who.int/publications/2009/9789241597838_eng.pdf

Blueprints for Violence Prevention (<http://www.colorado.edu/cspv/blueprints/>)

Reviewed injury, violence and safety. No relevant resources

Community Guide (<http://www.thecommunityguide.org/violence/index.html>)

No relevant resources under child care resources or crime statistics

Centers for Disease Control and Prevention
(<http://www.cdc.gov/ViolencePrevention/index.html>)

Reviewed sexual violence and adverse childhood experiences, no relevant resources

World Bank (www.worldbank.org)

0 results

Text S3 – Search terms for Databases and Websites

Pubmed: 300 results (also for use for EMBASE and Web of Knowledge platforms)

Filters used: since 1990-2012

(“drug control intervention*”[TIAB] OR “substance abuse*”[TIAB] OR “illicit drug use”[TIAB] OR “street drugs”[TIAB] OR “abused drugs”[TIAB] OR “recreational drug*”[TIAB] OR “drug dependence”[TIAB] OR “drug deal*”[TIAB] OR “drug prohibition”[TIAB] OR “drug legalisation”[TIAB] OR “drug legalization”[TIAB] OR “drug addict*”[TIAB] OR narcotic*[TIAB] OR “illicit drug market*”[TIAB] OR “violent drug cultures” [TIAB] OR “drug control”[TIAB] OR “ illicit drug trafficking” [TIAB] OR “deterrence of drug abuse”[TIAB] OR “ support programmes”[TIAB] OR “treatment programmes”[TIAB] OR “drug rehab*”[TIAB] OR “detox”[TIAB] OR “detoxification”[TIAB] OR "safe-injection"[TIAB] OR "needle exchange"[TIAB])

AND

(prevention[TIAB] OR preventing[TIAB] OR prevent[TIAB] OR reduction[TIAB] OR reduce[TIAB] OR decrease[TIAB] OR decreased[TIAB] OR decreasing[TIAB] OR decline[TIAB] OR declining[TIAB] OR control[TIAB] OR controlling[TIAB] OR impact [TIAB] OR effect[TIAB] OR effects[TIAB] OR affect[TIAB] OR affecting[TIAB] OR affects[TIAB] OR change[TIAB] OR changing[TIAB] OR changes[TIAB] OR intervene[TIAB] OR intervention*[TIAB])

AND

(“domestic abuse*”[TIAB] OR “physical abuse*”[TIAB] OR “partner abuse*”[TIAB] OR violent[TIAB] OR violence[TIAB] OR assault[TIAB] OR homicide[TIAB] OR gang[TIAB] OR gangs[TIAB] OR gang violence[TIAB] OR bully[TIAB] OR aggression[TIAB] OR aggressive[TIAB] OR robbery[TIAB] OR assault[TIAB] OR GBH[TIAB] OR contact crime[TIAB] OR interpersonal violence[TIAB])

AND

(youth[TIAB] OR adolescen*[TIAB] OR teenage*[TIAB] OR teen*[TIAB] OR juvenile*[TIAB] OR school*[TIAB] OR minors[TIAB])

Proquest (Sociological abstracts + IBBS + ERIC) : 550 results (peer reviewed : 134 results)

Ebscohost (Psycinfo + CINAHL + Humanities international) : 473 results (1990-2012), (peer reviewed 269)

(AB(“drug control intervention*” OR “substance abuse*” OR “illicit drug use” OR “street drugs” OR “abused drugs” OR “recreational drug*” OR “drug dependence” OR “drug deal*” OR “drug prohibition” OR “drug legalisation” OR “drug legalization” OR “drug

addict*" OR narcotic* OR "illicit drug market*" OR "violent drug cultures" OR "drug control" OR " illicit drug trafficking" OR "deterrence of drug abuse" OR " support programmes" OR "treatment programmes" OR "drug rehab*" OR "detox" OR "detoxification" OR "safe-injection" OR "needle exchange") OR TI("drug control intervention*" OR "substance abuse*"OR "illicit drug use" OR "street drugs" OR "abused drugs" OR "recreational drug*" OR "drug dependence" OR "drug deal*"OR "drug prohibition" OR "drug legalisation" OR "drug legalization" OR "drug addict*" OR narcotic* OR "illicit drug market*" OR "violent drug cultures" OR "drug control" OR " illicit drug trafficking" OR "deterrence of drug abuse" OR " support programmes" OR "treatment programmes" OR "drug rehab*" OR "detox" OR "detoxification" OR "safe-injection" OR "needle exchange"))

AND

(AB(prevention OR preventing OR prevent OR reduction OR reduce OR decrease OR decreased OR decreasing OR decline OR declining OR control OR controlling OR impact OR effect OR effects OR affect OR affecting OR affects OR change OR changing OR changes OR intervene OR intervention*) OR TI(prevention OR preventing OR prevent OR reduction OR reduce OR decrease OR decreased OR decreasing OR decline OR declining OR control OR controlling OR impact OR effect OR effects OR affect OR affecting OR affects OR change OR changing OR changes OR intervene OR intervention*))

AND

(AB("domestic abuse*" OR "physical abuse*" OR "partner abuse*" OR violent OR violence OR assault OR homicide OR gang OR gangs OR gang violence OR bully OR aggression OR aggressive OR robbery OR assault OR GBH OR contact crime OR interpersonal violence) OR TI("domestic abuse*" OR "physical abuse*" OR "partner abuse*" OR violent OR violence OR assault OR homicide OR gang OR gangs OR gang violence OR bully OR aggression OR aggressive OR robbery OR assault OR GBH OR contact crime OR interpersonal violence))

AND

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Cochrane library: 264 results

(violent:ti,ab) OR (violence:ti,ab) AND (adolescents:ti,ab) OR (teenage:ti,ab) OR (teenagers:ti,ab) OR (juvenile:ti,ab) AND (exp substance abuse:ti,ab) OR (school- based intervention:ti,ab) AND (prevention:ti,ab)

Social care online: 133 results

title="physical abuse* " or title=" partner abuse*" and title="violent " and title=" violence"
and title="assault " and title="homicide " and title=" youth" and title="adolescents " and
title="teenagers " and title="teens " and title="juveniles " and title="prevention " and title="
intervention" and title="reduction " and title=" drug control intervention*" and title="exp
substance abuse* "

Campbell collaboration: 211 results

(“drug control intervention*” OR “substance abuse*” OR “illicit drug use” OR “street
drugs” OR “abused drugs” OR “recreational drug*” OR “drug dependence” OR “drug deal*”
OR “drug prohibition” OR “drug legalisation” OR “drug legalization” OR “drug
addict*” OR narcotic* OR “illicit drug market*” OR “violent drug cultures” OR “drug
control” OR “ illicit drug trafficking” OR “deterrence of drug abuse” OR “ support
programmes” OR “treatment programmes” OR “drug rehab*” OR “detox” OR
“detoxification” OR "safe-injection" OR "needle exchange”)

AND

(Prevention OR preventing OR prevent OR reduction OR reduce OR decrease OR
decreased OR decreasing OR decline OR declining OR control OR controlling OR
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AND

(“domestic abuse*” OR “physical abuse*” OR “partner abuse*” OR violent OR
violence OR assault OR homicide OR gang OR gangs OR gang violence OR bully
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" intervention" or "reduction " and " drug control intervention*" or "exp substance abuse* "

Regional databases

Western Pacific

WPRIM: 107 results

Filters used: 1990-2012, child 6-12, adolescent 13-18, human

"physical abuse" or " partner abuse" or "violent " or " violence" or "assault " or "homicide "
and " youth" or "adolescents " or "teenagers " or "teens " or "juveniles " and "prevention " or
" intervention" or "reduction " and " drug control intervention*" or "exp substance abuse* "
or "health education " or "counselling"

Eastern Mediterranean

IMEMR: 33 results

No filters used, keyword search

(physical abuse or partner abuse or violent or violence or assault or homicide or crime or
gang or bully or aggression or aggressive)

and

(youth or adolescents or teenagers or teens or juveniles or minor or child or children or
childhood)

and

(prevention or intervention or reduction or drug control intervention or exp substance abuse
or health education or counselling or street drugs or illicit drugs or recreational drugs or drug
dealing or drug prohibition or drug legalization or drug addiction)

South East Asia

IMSEAR: 0 results

(physical abuse or partner abuse or violent or violence or assault or homicide or crime or
gang or bully or aggression or aggressive)

and

(youth or adolescents or teenagers or teens or juveniles or minor or child or children or
childhood)

and

(prevention or intervention or reduction or drug control intervention or exp substance abuse or health education or counselling or street drugs or illicit drugs or recreational drugs or drug dealing or drug prohibition or drug legalization or drug addiction or marijuana or cannabis or hashish or ecstasy or cocaine or crack cocaine or hallucinogen or MDMA or heroin or health education or counselling)

Latin America and the Caribbean

VHL: 1 result

All indexes, all sources

(physical abuse or partner abuse or violent or violence or assault or homicide or crime or gang or bully or aggression or aggressive)

and

(youth or adolescents or teenagers or teens or juveniles or minor or child or children or childhood)

and

(prevention or intervention or reduction or drug control intervention or exp substance abuse or health education or counselling or street drugs or illicit drugs or recreational drugs or drug dealing or drug prohibition or drug legalization or drug addiction or marijuana or cannabis or hashish or ecstasy or cocaine or crack cocaine or hallucinogen or MDMA or heroin or health education or counselling)

Africa: 3 results

<http://indexmedicus.afro.who.int/cgi-bin/wxis.exe/iah/?IsisScript=iah/iah.xis&lang=I&base=AIM>

(physical abuse or partner abuse or violent or violence or assault or homicide or crime or gang or bully or aggression or aggressive)

and

(youth or adolescents or teenagers or teens or juveniles or minor or child or children or childhood)

and

(drug control intervention or exp substance abuse or health education or counselling or street drugs or illicit drugs or recreational drugs or drug dealing or drug prohibition or drug legalization or drug addiction or marijuana or cannabis or hashish or ecstasy or cocaine or crack cocaine or hallucinogen or MDMA or heroin or health education or counselling)

and

(prevention or preventing or prevent or intervention or reduction or reduce or decrease or decreasing or decreased or decline or declining or drop or fewer or fall or less or control or controlling or impact or effect or effects or affect or change or changing or changes or intervene)

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Community Guide (<http://www.thecommunityguide.org/violence/index.html>)

No relevant resources under child care resources or crime statistics

Centers for Disease Control and Prevention

(<http://www.cdc.gov/ViolencePrevention/index.html>)

Reviewed sexual violence and adverse childhood experiences, no relevant resources

World Bank (www.worldbank.org)

0 results

Text S4 – Checklist for included studies

TYPE OF STUDIES

Randomized-Controlled Trials

Non-Randomized controlled trials, quasi-experimental designs

Prospective and retrospective cohort studies

TYPE OF PARTICIPANTS

Teenagers, adolescents, youths between the ages of 10-29 years old (involved with substance abuse or illicit drug use, recreational drugs, trafficking, narcotics).

TYPE OF INTERVENTION

Interventions that address illicit drug use by perpetrators and whether these reduce violence.

Interventions that address the violence used as economic compulsive, violent crimes to access drugs (e.g. methadone programmes etc. if they are evaluated for violence)

Interventions that address violence inherent to illegal drug markets (gang activity etc., this could be search policies etc.).

TYPE OF CONTROL

No intervention

TYPE OF OUTCOMES

Primary outcomes

Change (increase or decrease) in levels of assault, homicide, physical violence, aggression, bullying, delinquency, school violence, sexual violence, dangerous behaviour, externalising behaviour.

Secondary outcomes

Dangerous and externalising behaviours

Exclusion criteria

Participants may not have mental disorders

Date of publication pre 1990

Child, Elder abuse

Alcohol abuse intervention programs

Text S5 - PRISMA checklist

Section/topic	#	Checklist item	Reported on page #
TITLE			
Title	1	Identify the report as a systematic review, meta-analysis, or both.	Title 1
ABSTRACT			
Structured summary	2	Provide a structured summary including, as applicable: background; objectives; data sources; study eligibility criteria, participants, and interventions; study appraisal and synthesis methods; results; limitations; conclusions and implications of key findings; systematic review registration number.	Abstract 2
INTRODUCTION			
Rationale	3	Describe the rationale for the review in the context of what is already known.	3
Objectives	4	Provide an explicit statement of questions being addressed with reference to participants, interventions, comparisons, outcomes, and study design (PICOS).	3 para 4
METHODS			
Protocol and registration	5	Indicate if a review protocol exists, if and where it can be accessed (e.g., Web address), and, if available, provide registration information including registration number.	4 Para 2
Eligibility criteria	6	Specify study characteristics (e.g., PICOS, length of follow-up) and report characteristics (e.g., years considered, language, publication status) used as criteria for eligibility, giving rationale.	4
Information sources	7	Describe all information sources (e.g., databases with dates of coverage, contact with study authors to identify additional studies) in the search and date last searched.	4-5, 18-19
Search	8	Present full electronic search strategy for at least one database, including any limits used, such that it could be repeated.	23-28, 29-35
Study selection	9	State the process for selecting studies (i.e., screening, eligibility, included in systematic review, and, if applicable, included in the meta-analysis).	4, 16-18, 36
Data collection process	10	Describe method of data extraction from reports (e.g., piloted forms, independently, in duplicate) and any processes for obtaining and confirming data from investigators.	5, 19-20
Data items	11	List and define all variables for which data were sought (e.g., PICOS, funding sources) and any assumptions and simplifications made.	5
Risk of bias in individual studies	12	Describe methods used for assessing risk of bias of individual studies (including specification of whether this was done at the study or outcome level), and how this information is to be used in any data synthesis.	N/A
Summary measures	13	State the principal summary measures (e.g., risk ratio, difference in means).	N/A

Synthesis of results	14	Describe the methods of handling data and combining results of studies, if done, including measures of consistency (e.g., I^2) for each meta-analysis.	5
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Section/topic	#	Checklist item	Reported on page #
Risk of bias across studies	15	Specify any assessment of risk of bias that may affect the cumulative evidence (e.g., publication bias, selective reporting within studies).	
Additional analyses	16	Describe methods of additional analyses (e.g., sensitivity or subgroup analyses, meta-regression), if done, indicating which were pre-specified.	N/A
RESULTS			
Study selection	17	Give numbers of studies screened, assessed for eligibility, and included in the review, with reasons for exclusions at each stage, ideally with a flow diagram.	14
Study characteristics	18	For each study, present characteristics for which data were extracted (e.g., study size, PICOS, follow-up period) and provide the citations.	5-6
Risk of bias within studies	19	Present data on risk of bias of each study and, if available, any outcome level assessment (see item 12).	
Results of individual studies	20	For all outcomes considered (benefits or harms), present, for each study: (a) simple summary data for each intervention group (b) effect estimates and confidence intervals, ideally with a forest plot.	5-6
Synthesis of results	21	Present results of each meta-analysis done, including confidence intervals and measures of consistency.	5-6
Risk of bias across studies	22	Present results of any assessment of risk of bias across studies (see Item 15).	
Additional analysis	23	Give results of additional analyses, if done (e.g., sensitivity or subgroup analyses, meta-regression [see Item 16]).	
DISCUSSION			
Summary of evidence	24	Summarize the main findings including the strength of evidence for each main outcome; consider their relevance to key groups (e.g., healthcare providers, users, and policy makers).	7
Limitations	25	Discuss limitations at study and outcome level (e.g., risk of bias), and at review-level (e.g., incomplete retrieval of identified research, reporting bias).	7
Conclusions	26	Provide a general interpretation of the results in the context of other evidence, and implications for future research.	7-9
FUNDING			
Funding	27	Describe sources of funding for the systematic review and other support (e.g., supply of data); role of funders for the systematic review.	9

Appendix 6 - Studies excluded based on full text

First Author	Year	Reasons for Exclusion
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Inappropriate outcomes or outcome measurement

O'Neill	2011	Only alcohol and tobacco
Cirillo	1998	
Lochman	2003	Only behavioural outcomes
Schinke	2004	
Hishinuma	2009	

Study design

Neace	2012	No drug intervention
Painter	2008	Participants had existing psychiatric diagnosis
Roberts-L	2010	Participants had existing psychiatric diagnosis
Henggeler	2002	Participants had existing psychiatric diagnosis
Kethineni	2011	

Appendix 7: Journal instructions to Authors

Guides for authors submitting to PLOS ONE

Taken from:

<http://www.plosone.org/static/guidelines>

Access: 1 August 2013

PLOS ONE Manuscript Guidelines

1. Format Requirements

PLOS ONE does **not** consider presubmission inquiries. All submissions should be prepared with the following files:

- Cover letter
 - Manuscript, including tables and figure legends
 - Figures (guidelines for preparing figures can be found at the [Figure and Table Guidelines](#))
- Prior to submission, authors who believe their manuscripts would benefit from professional editing are encouraged to use language-editing and copyediting services. Obtaining this service is the responsibility of the author, and should be done before initial submission. These services can be found on the web using search terms like "scientific editing service" or "manuscript editing service." Submissions are **not** copyedited before publication.

Submissions that do not meet the [PLOS ONE Publication Criterion for language standards](#) may be rejected.

Cover Letter

You should supply an approximately one page cover letter that:

- Concisely summarizes why your paper is a valuable addition to the scientific literature
- Briefly relates your study to previously published work
- Specifies the type of article you are submitting (for example, research article, systematic review, meta-analysis, clinical trial)
- Describes any prior interactions with PLOS regarding the submitted manuscript
- Suggests appropriate *PLOS ONE* Academic Editors to handle your manuscript (view a [complete listing of our academic editors](#))
- Lists any recommended or opposed reviewers

Your cover letter should **not** include requests to reduce or waive publication fees. Should your manuscript be accepted, you will have the opportunity to include your requests at that time. See [PLOS ONE Editorial Policy](#) for more information regarding publication fees.

Manuscript Organization

PLOS ONE considers manuscripts of any length. There are no explicit restrictions for the number of words, figures, or the length of the supporting information, although we encourage a concise and accessible writing style. We will **not** consider monographs.

All manuscripts should include line numbers and page numbers.

Manuscripts should begin with the ordered sections:

- Title
- Authors
- Affiliations
- Abstract
- Introduction

and end with the sections of:

- Acknowledgments
- References
- Figure Legends
- Tables

Figures should not be included in the main manuscript file. Each figure must be prepared and submitted as an individual file. Find more information about preparing figures [here](#).

The title, authors, and affiliations should all be included on a title page as the first page of the manuscript file.

There are no explicit requirements for section organization between these beginning and ending sections. Articles may be organized in different ways and with different section titles, according to the authors' preference. In most cases, internal sections include:

- Materials and Methods
- Results
- Discussion
- Conclusions (optional)

PLOS ONE has no specific requirements for the order of these sections, and in some cases it may be appropriate to combine sections. Guidelines for individual sections can be found [below](#).

Abbreviations should be kept to a minimum and defined upon first use in the text. Non-standard abbreviations should not be used unless they appear at least three times in the text.

Standardized nomenclature should be used as appropriate, including appropriate usage of species names and SI units.

Manuscript File Type Requirements

Authors may submit their manuscript files in Word (as .doc or .docx), LaTeX (as .pdf), or RTF format. Only RTF and .doc files can be used during the production process.

LaTeX Submissions. If you would like to submit your manuscript using LaTeX, you must author your article using the [PLOS ONE LaTeX template](#) and [BibTeX style sheet](#). Articles prepared in LaTeX may be submitted in PDF format for use during the review process. After acceptance, however, .tex files and formatting information will be required as a zipped file. Please consult our [LaTeX guidelines](#) for a list of what will be required.

Submissions with equations. If your manuscript is or will be in .docx format and contains equations, you must follow the instructions below to make sure that your equations are editable when the file enters production.

If you have not yet composed your article, you can ensure that the equations in your .docx file remain editable in .doc by enabling "Compatibility Mode" before you begin. To do this, open a new document and save as Word 97-2003 (*.doc). Several features of Word 2007/10 will now be inactive, including the built-in equation editing tool. You can insert equations in one of the two ways listed below.

If you have already composed your article as .docx and used its built-in equation editing tool, your equations will become images when the file is saved down to .doc. To resolve this problem, re-key your equations in one of the two following ways.

1. Use MathType to create the equation (recommended)
2. Go to Insert > Object > Microsoft Equation 3.0 and create the equation

If, when saving your final document, you see a message saying "Equations will be converted to images," your equations are no longer editable and PLoS will not be able to accept your file.

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2. Guidelines for Standard Sections

Title

Manuscripts must be submitted with both a full title and a short title, which will appear at the top of the PDF upon publication if accepted. Only the full title should be included in the manuscript file; the short title will be entered during the online submission process.

The full title must be 150 characters or fewer. It should be specific, descriptive, concise, and comprehensible to readers outside the subject field. Avoid abbreviations if possible. Where appropriate, authors should include the species or model system used (for biological papers) or type of study design (for clinical papers).

Examples:

- Impact of Cigarette Smoke Exposure on Innate Immunity: A *Caenorhabditis elegans* Model
- Solar Drinking Water Disinfection (SODIS) to Reduce Childhood Diarrhoea in Rural Bolivia: A Cluster-Randomized, Controlled Trial

The short title must be 50 characters or fewer and should state the topic of the paper.

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Authors and Affiliations

All author names should be listed in the following order:

- First names (or initials, if used),
- Middle names (or initials, if used), and
- Last names (surname, family name)

Each author should list an associated department, university, or organizational affiliation and its location, including city, state/province (if applicable), and country. If the article has been submitted on behalf of a consortium, all author names and affiliations should be listed at the end of the article.

This information cannot be changed after initial submission, so please ensure that it is correct.

To qualify for authorship, a researcher should contribute to **all** of the following:

1. Conception and design of the work, acquisition of data, or analysis and interpretation of data
2. Drafting the article or revising it critically for important intellectual content
3. Final approval of the version to be published

All persons designated as authors should qualify for authorship, and all those who qualify should be listed. Each author must have participated sufficiently in the work to take public responsibility for appropriate portions of the content. Those who contributed to the work but do not qualify for authorship should be listed in the acknowledgments.

When a large group or center has conducted the work, the author list should include the individuals whose contributions meet the criteria defined above, as well as the group name.

One author should be designated as the corresponding author, and his or her email address or other contact information should be included on the manuscript cover page. This information will be published with the article if accepted.

See the [PLOS ONE Editorial Policy regarding authorship criteria](#) for more information.

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Abstract

The abstract should:

- Describe the main objective(s) of the study
- Explain how the study was done, including any model organisms used, without methodological detail
- Summarize the most important results and their significance
- Not exceed 300 words

Abstracts should **not** include:

- Citations
 - Abbreviations, if possible
- [Back to top](#)

Introduction

The introduction should:

- Provide background that puts the manuscript into context and allows readers outside the field to understand the purpose and significance of the study
 - Define the problem addressed and why it is important
 - Include a brief review of the key literature
 - Note any relevant controversies or disagreements in the field
 - Conclude with a brief statement of the overall aim of the work and a comment about whether that aim was achieved
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Materials and Methods

This section should provide enough detail to allow suitably skilled investigators to fully replicate your study. Specific information and/or protocols for new methods should be included in detail. If materials, methods, and protocols are well established, authors may cite articles where those protocols are described in detail, but the submission should include sufficient information to be understood independent of these references.

We encourage authors to submit detailed protocols for newer or less well-established methods as Supporting Information. These are published online only, but are linked to the article and are fully searchable. Further information about formatting Supporting Information files, can be found [here](#).

Methods sections of papers on research using **human or animal subjects and/or tissue or field sampling** must include required ethics statements. See the [Reporting Guidelines for human research](#), [clinical trials](#), [animal research](#), and [observational and field studies](#) for more information.

Methods sections of papers with **data that should be deposited in a publicly available database** should specify where the data have been deposited and provide the relevant accession numbers and version numbers, if appropriate. Accession numbers should be provided in parentheses after the entity on first use. If the accession numbers have not yet been obtained at the time of submission, please state that they will be provided during review. They must be provided prior to publication.

Methods sections of papers using **cell lines** must state the origin of the cell lines used. See the [Reporting Guidelines for cell line research](#) for more information.

Methods sections of papers adding **new taxon names** to the literature must follow the Reporting Guidelines below for a new [zoological taxon](#), [botanical taxon](#), or [fungal taxon](#).

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Results, Discussion, and Conclusions

These sections may all be separate, or may be combined to create a mixed Results/Discussion section (commonly labeled "Results and Discussion") or a mixed Discussion/Conclusions section (commonly labeled "Discussion"). These sections may be further divided into subsections, each with a concise subheading, as appropriate. These sections have no word limit, but the language should be clear and concise.

Together, these sections should describe the results of the experiments, the interpretation of these results, and the conclusions that can be drawn. Authors should explain how the results relate to the hypothesis presented as the basis of the study and provide a succinct explanation of the implications of the findings, particularly in relation to previous related studies and potential future directions for research.

PLOS ONE editorial decisions do not rely on perceived significance or impact, so authors should avoid overstating their conclusions. See the *PLOS ONE* [Publication Criteria](#) for more information.

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Acknowledgments

People who contributed to the work but do not fit the *PLOS ONE* [authorship criteria](#) should be listed in the acknowledgments, along with their contributions. You must ensure that anyone named in the acknowledgments agrees to being so named.

Funding sources should **not** be included in the acknowledgments, or anywhere in the manuscript file. You will provide this information during the manuscript submission process.

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References

Only published or accepted manuscripts should be included in the reference list. Manuscripts that have been submitted but not yet accepted should not be cited. Limited citation of unpublished work should be included in the body of the text only as "unpublished data."

References must be listed at the end of the manuscript and numbered in the order that they appear in the text. In the text, citations should be indicated by the reference number in brackets. Journal name abbreviations should be those found in the [NCBI databases](#). A number of reference software companies supply PLOS style files (e.g., [Reference Manager](#), [EndNote](#)).

Proper formatting of the references is crucial; some examples are shown below.

- **Published papers.** Hou WR, Hou YL, Wu GF, Song Y, Su XL, et al. (2011) cDNA, genomic sequence cloning and overexpression of ribosomal protein gene L9 (rpL9) of the giant panda (*Ailuropoda melanoleuca*). *Genet Mol Res* 10: 1576-1588.

Note: Use of a DOI number for the full-text article is acceptable as an alternative to or in addition to traditional volume and page numbers.

- **Accepted, unpublished papers.** Same as above, but “In press” appears instead of the page numbers.
- **Electronic journal articles.** Huynen MMTE, Martens P, Hilderink HBM (2005) The health impacts of globalisation: a conceptual framework. *Global Health* 1: 14. Available: <http://www.globalizationandhealth.com/content/1/1/14>. Accessed 25 January 2012.
- **Books.** Bates B (1992) *Bargaining for life: A social history of tuberculosis*. Philadelphia: University of Pennsylvania Press. 435 p.
- **Book chapters** Hansen B (1991) New York City epidemics and history for the public. In: Harden VA, Risse GB, editors. *AIDS and the historian*. Bethesda: National Institutes of Health. pp. 21-28.
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Tables

Tables should be included at the end of the manuscript. All tables should have a concise title. Footnotes can be used to explain abbreviations. Citations should be indicated using the same style as outlined [above](#). Tables occupying more than one printed page should be avoided, if possible. Larger tables can be published as [Supporting Information](#). Please ensure that table formatting conforms to our [Guidelines for table preparation](#).

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Figure Legends

Figures should **not** be included in the manuscript file, but figure legends should be. Guidelines for preparing figures can be found [here](#).

Figure legends should describe the key messages of a figure. Legends should have a short title of 15 words or less. The full legend should have a description of the figure and allow readers to understand the figure without referring to the text. The legend itself should be succinct, avoid lengthy descriptions of methods, and define all non-standard symbols and abbreviations.

Further information about figure legends can be found in the [Figure Guidelines](#).

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3. Specific Reporting Guidelines

Human Subject Research

Methods sections of papers on research using human subject or samples must include ethics statements that specify:

- The name of the approving institutional review board or equivalent committee(s). If approval was not obtained, the authors must provide a detailed statement explaining why it was not needed
- Whether informed consent was written or oral. If informed consent was oral, it must be stated in the manuscript:
 - Why written consent could not be obtained
 - That the Institutional Review Board (IRB) approved use of oral consent
 - How oral consent was documented

For studies involving humans categorized by race/ethnicity, age, disease/disabilities, religion, sex/gender, sexual orientation, or other socially constructed groupings, authors should:

- Explicitly describe their methods of categorizing human populations
 - Define categories in as much detail as the study protocol allows
 - Justify their choices of definitions and categories, including for example whether any rules of human categorization were required by their funding agency
 - Explain whether (and if so, how) they controlled for confounding variables such as socioeconomic status, nutrition, environmental exposures, or similar factors in their analysis
- In addition, outmoded terms and potentially stigmatizing labels should be changed to more current, acceptable terminology. Examples: "Caucasian" should be changed to "white" or "of [Western] European descent" (as appropriate); "cancer victims" should be changed to "patients with cancer."

For papers that include identifying, or potentially identifying, information, authors must download the [Consent Form for Publication in a PLOS Journal](#) (PDF), which the individual, parent, or guardian must sign once they have read the paper and been informed about the terms of PLOS open-access license. The signed consent form should not be submitted with the manuscript, but authors should securely file it in the individual's case notes and the methods section of the manuscript should explicitly state that consent authorization for publication is on file, using wording like:

The individual in this manuscript has given written informed consent (as outlined in PLOS consent form) to publish these case details.

For more information about *PLOS ONE* policies regarding human subject research, see the [Publication Criteria](#) and [Editorial Policies](#).

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Clinical Trials

Authors of manuscripts describing the results of clinical trials must adhere to the [CONSORT](#) reporting guidelines appropriate to their trial design, available on the [CONSORT Statement website](#). Before the paper can enter peer review, authors must:

1. Provide the registry name and number in the methods section of the manuscript
2. Provide a copy of the trial protocol as approved by the ethics committee and a completed [CONSORT checklist](#) as Supporting Information (which will be published alongside the paper, if accepted)

3. Include the [CONSORT flow diagram](#) as the manuscript's "Figure 1"
Any deviation from the trial protocol must be explained in the paper. Authors must explicitly discuss informed consent in their paper, and we reserve the right to ask for a copy of the patient consent form.

The methods section must include the name of the registry, the registry number, and the URL of your trial in the registry database for each location in which the trial is registered.

For more information about *PLOS ONE* policies regarding clinical trials, see the [Editorial Policies](#).

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Animal Research

Methods sections of manuscripts reporting results of animal research must include required ethics statements that specify:

- The full name of the relevant ethics committee that approved the work, and the associated permit number(s) (where ethical approval is not required, the manuscript should include a clear statement of this and the reason why)
- Relevant details for efforts taken to ameliorate animal suffering
For example:

This study was carried out in strict accordance with the recommendations in the Guide for the Care and Use of Laboratory Animals of the National Institutes of Health. The protocol was approved by the Committee on the Ethics of Animal Experiments of the University of Minnesota (Permit Number: 27-2956). All surgery was performed under sodium pentobarbital anesthesia, and all efforts were made to minimize suffering.

The organism(s) studied should always be stated in the abstract. Where research may be confused as pertaining to clinical research, the animal model should also be stated in the title.

We encourage authors to use the [ARRIVE \(Animal Research: Reporting of *In Vivo* Experiments\) guidelines](#) as a reference.

For more information about *PLOS ONE* policies regarding animal research, see the [Publication Criteria](#) and [Editorial Policies](#).

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Observational and Field Studies

Methods sections for submissions reporting on any type of field study must include ethics statements that specify:

- Permits and approvals obtained for the work, including the full name of the authority that approved the study; if none were required, authors should explain why
- Whether the land accessed is privately owned or protected
- Whether any protected species were sampled
- Full details of animal husbandry, experimentation, and care/welfare, where relevant

For more information about *PLOS ONE* policies regarding observational and field studies, see the [Publication Criteria](#) and [Editorial Policies](#).

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Cell Line Research

Methods sections for submissions reporting on research with cell lines should state the origin of any cell lines. For established cell lines the provenance should be stated and references must also be given to either a published paper or to a commercial source. If previously unpublished *de novo* cell lines were used, including those gifted from another laboratory, details of institutional review board or ethics committee approval must be given, and confirmation of written informed consent must be provided if the line is of human origin.

For more information about *PLOS ONE* policies regarding observational and field studies, see the [Publication Criteria](#).

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Systematic Review/Meta-Analysis

A systematic review paper, as defined by [The Cochrane Collaboration](#), is a review of a clearly formulated question that uses explicit, systematic methods to identify, select, and critically appraise relevant research, and to collect and analyze data from the studies that are included in the review. These reviews differ substantially from narrative-based reviews or synthesis articles. Statistical methods (meta-analysis) may or may not be used to analyze and summarize the results of the included studies.

Reports of systematic reviews and meta-analyses must include a completed [PRISMA \(Preferred Reporting Items for Systematic Reviews and Meta-Analyses\) checklist and flow diagram](#) to accompany the main text. Blank templates are available here:

- Checklist: [PDF](#) or [Word document](#)
- Flow diagram: [PDF](#) or [Word document](#)

Authors must also state in their "Methods" section whether a protocol exists for their systematic review, and if so, provide a copy of the protocol as Supporting Information and provide the registry number in the abstract.

If your article is a Systematic Review or a Meta-Analysis you should:

- State this in your cover letter
- Select "Research Article" as your article type when submitting
- Include the PRISMA flowchart as Figure 1 (required where applicable)
- Include the PRISMA checklist as Supporting Information

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Paleontology and Archaeology Research

Manuscripts reporting paleontology and archaeology research must include descriptions of methods and specimens in sufficient detail to allow the work to be reproduced. Data sets supporting statistical and phylogenetic analyses should be provided, preferably in a format that allows easy re-use.

Specimen numbers and complete repository information, including museum name and geographic location, are required for publication. Locality information should be provided in the manuscript as legally allowable, or a statement should be included giving details of the availability of such information to qualified researchers.

If permits were required for any aspect of the work, details should be given of all permits that were obtained, including the full name of the issuing authority. This should be accompanied by the following statement:

All necessary permits were obtained for the described study, which complied with all relevant regulations.

If no permits were required, please include the following statement:

No permits were required for the described study, which complied with all relevant regulations.

See the [PLOS ONE Editorial Policies](#) for more information regarding manuscripts describing paleontology and archaeology research.

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Software Papers

Manuscripts describing software should provide full details of the algorithms designed. Describe any dependencies on commercial products or operating system. Include details of the supplied test data and explain how to install and run the software. A brief description of enhancements made in the major releases of the software may also be given. Authors should provide a direct link to the deposited software from within the paper.

See the [PLOS ONE Editorial Policies](#) for more information about submitting manuscripts.

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Database Papers

For descriptions of databases, provide details about how the data were curated, as well as plans for long-term database maintenance, growth, and stability. Authors should provide a direct link to the database hosting site from within the paper.

See the [PLOS ONE Editorial Policies](#) for more information about submitting manuscripts describing databases.