saxinstitute

Evidence Check

Effectiveness of alcohol and other drug interventions in at-risk Aboriginal youth

An **Evidence Check** rapid review brokered by the Sax Institute for the NSW Ministry of Health. June 2017.

An **Evidence Check** rapid review brokered by the Sax Institute for the NSW Ministry of Health.
June 2017

This report was prepared by:

Christopher M Doran[1], Irina Kinchin[1], Roxanne Bainbridge[1], Janya McCalman[1] and Anthony Shakeshaft.[2]

1. Centre for Indigenous Health Equity Research, School of Health, Medical & Applied Sciences, Central Queensland University
2. National Drug and Alcohol Research Centre, University of New South Wales

June 2017

Enquiries regarding this report may be directed to the:

Principal Analyst
Knowledge Exchange Program
Sax Institute
www.saxinstitute.org.au
knowledge.exchange@saxinstitute.org.au
Phone: +61 2 91889500

Suggested Citation:

Doran CM, Kinchin I, Bainbridge R, McCalman J, Shakeshaft AP. Effectiveness of alcohol and other drug interventions in at-risk Aboriginal youth: an Evidence Check rapid review brokered by the Sax Institute (www.saxinstitute.org.au) for the NSW Ministry of Health, 2017.

Effectiveness of alcohol and other drug interventions in at-risk Aboriginal youth

An **Evidence Check** rapid review brokered by the Sax Institute for the NSW Ministry of Health.
June 2017

This report was prepared by Christopher M Doran, Irina Kinchin, Roxanne Bainbridge, Janya McCalman and Anthony Shakeshaft.

Contents

List of tables

Glossary of terms

ACCHS	Aboriginal Community Controlled Health Services
AI	American Indian
AOD	Alcohol and Other Drugs
CBPR	Community Based Participatory Research
CBT	Cognitive Behaviour Therapy
CRA	Community Reinforcement Approach
CRAFT	Community Reinforcement and Family Training
DAPCP	Drug and Alcohol Population and Community Programs
DDT	Diabetical Behaviour Therapy
ET	Elluam Tungiinun
GONA	Gathering of Native Americans
HAWK2	Honoring Ancient Wisdom and Knowledge 2: Prevention and Cessation
HLP	Harmful Legal Products
KR	Keeping it Real
KKS	Keeping Kids Smokefree
L2W	Living in Two Worlds
MI	Motivational Interviewing
NITV	National Indigenous Television
SBI	Screening and Brief Intervention
TPR	Tribal Participatory Research
TSS	Transition Support Services
WYDAC	Warlpiri Youth Development Aboriginal Corporation
YA	Yupiucimta Asvairtuumallerkaa
YDAC	Youth Drug and Alcohol Court
YDU	Youth Development Unit
YSAP	Youth and Solvent Addiction Program

Executive summary

Background / Purpose of the review

New South Wales Drug and Alcohol Population and Community Programs wish to develop an Alcohol and Other Drug (AOD) prevention, early intervention and/or harm reduction program for Australian young people at risk of AOD related harm, located in metropolitan, rural and regional locations in NSW. An evidence check was conducted to identify the most effective interventions to reduce the risk of AOD related harm among at-risk Aboriginal young people.

Review questions

The specific review questions were:

Question 1: For at-risk Aboriginal young people, what types of community-based and justice-based AOD interventions have been shown to be the most effective in promoting protective factors or reducing risk factors to prevent AOD related harm?

Question 2: For the interventions identified in Q1, what were the critical factors for successful implementation and sustainability?

Summary of methods

An accredited librarian working at a leading Australian university assisted with identifying the search strings and review of both peer-reviewed and grey literature across four countries: Australia, Canada, New Zealand and the US. Specific search strings were developed and applied to 11 electronic databases. Experts in the field were contacted for advice on key documents and references from key articles were scrutinised. The results were limited to English language studies published from January 2007 to March 2017.

The scope of the initial search was widened to include:

1. Evidence about effective interventions for young Aboriginal populations for other health or social issues (e.g. effective sexual health interventions targeting at-risk Aboriginal young people)
2. Evidence about effective AOD interventions in vulnerable young non-Indigenous Australian populations (for example, young homeless; in youth justice settings; socially, educationally or financially disadvantaged; or geographically isolated).

Assessment of the quality of evidence was undertaken using the Canadian hierarchy of promising practice evidence. The hierarchy outlines three categories (and four levels) of evidence ranging from best practice to emerging.

Key findings

Fifty-two studies were included in the synthesis of the literature: 38 from the peer-reviewed and 14 from the grey literature (Table 1). A total of 34 studies focused specifically on Indigenous youth, three studies focused on vulnerable youth and 15 studies focused on Indigenous populations. 12 studies met the criteria for best practice evidence (level 1 or 2 evidence) and included: six reviews, four school-based interventions, one community-based and one web-based intervention. 19 studies met the criteria for promising practice evidence (level 3 evidence) and included: ten community-based, five school-based, three treatment-based and one diversion program. 21 studies met the criteria for emerging practice evidence (level 4 evidence) and included seven peer-reviewed studies and 14 studies identified from the grey literature, including nine summary reports.

Table 1: Summary of literature review

Level of evidence/ Substance targeted	Setting					Review, summary report	Total
	School-based	Community-based	Web-based	Diversion	Treatment-based		
Level 1 or 2: Best							
Substance use	3					3	6
Tobacco						1	1
Alcohol			1			2	3
Smoking	1	1					2
Subtotal	*4*	*1*	*1*	*0*	*0*	*6*	*12*
Level 3: Promising							
Substance use	3	4		1	1		9
Tobacco							
Alcohol	1	5			2		8
Smoking	1	1					2
Subtotal	*5*	*10*	*0*	*1*	*3*		*19*
Level 4: Emerging							
Substance use	1	3	1	2		9	16
Tobacco							
Alcohol		2					2
Smoking					1		1
Resilience	1						1
Sexual health		1					1
Subtotal	*2*	*6*	*1*	*2*	*1*	*9*	*21*
Total	**11**	**17**	**2**	**3**	**4**	**15**	**52**

Question 1:

From the 12 studies that met the criteria for best practice evidence, only a handful provided guidance on effective AOD interventions for Indigenous young people. A common theme underpinning each intervention was that success requires strong community interest, engagement, leadership and sustainable funding. Calabria et al.[1, 2] suggested that the most promising approaches to reducing alcohol-related harm in Indigenous youth included community reinforcement, family training and coping skills training. Lee et al.[3] found that effective programs aimed at young people with a recognised AOD problem included community engagement, cultural and recreational activities, and regular rather than one-off initiatives.

Knight et al.[4] found apprenticeship-focused training to be effective in addressing multiple risk factors for juvenile offenders. Other effective/promising strategies included: web-based alcohol screening and brief intervention; the use of incentives to encourage behaviour change; and social media campaigns. Mohatt et al.[5] outlined an interesting community-driven strategy that relied on a 'toolbox' approach - a compendium of cultural activities that serve as a starting point in the development of interventions contextualised to customs and history of each local community.

The authors suggested that standardising interventions by the functions an intervention serves (protective factors promoted) instead of their forms or components (specific activities) can assist in refining community-based interventions. Another study of note was the Indigenous community-driven response to binge drinking outlined by Jainullabudeen et al.[6] This "Beat da Binge" strategy resulted in a National Drug and Alcohol Award for excellence in services for young people. McCalman et al.[7] suggested that such a community-led, researcher-integrated approach might provide a more effective blueprint for reducing alcohol-related harm than the traditional government or researcher-designed policies and programs that typically allow insufficient community input.

The grey literature identified a further five interventions targeting Indigenous young people at risk of AOD. These included two community-based multi-service programs and three communication/education campaigns. Two of these campaigns were NSW based – the Take Blaktion Campaign and the It's Your Choice, Have a Voice Campaign.

Both strategies are integrated communication and education campaigns designed to empower and educate Indigenous adolescents.

Question 2:

There are several key factors pertinent to successful implementation and sustainability. *Engagement* is fundamental. An effective intervention is likely to have local community support that takes advantage of partnership and engages with the community in all facets of an intervention – from conceptualisation, planning, implementation, evaluation and dissemination. Engagement is reinforced through paid positions of community elders or experts to create programs and organise.

Effective interventions *incorporate cultural values and activities* and have a strength-based focus (as opposed to using a deficit-based approach). Effective interventions are multi-faceted and flexible, and address both individual and community issues. They adopt a multi-pronged approach that combine a range of activities including educational, case management and work-skills development. Further, an intervention needs to be flexible enough to meet the needs of individual clients and use various delivery modes (through, for example, mentoring approaches, motivational interviewing or CBT techniques). Effective interventions are offered as regular rather than one-off initiatives. Sustainability is facilitated through the ability to develop infrastructure and/or systems and the ability to attract additional funding.

Gap analysis

The gap analysis suggests that more methodologically rigorous evaluations of interventions targeting multiple risk factors among high-risk young people are required, especially for those delivered in community settings and involving diversionary activities. Four key areas for improvement are: more precisely defining the risk factors experienced by high-risk young people; achieving greater consistency across interventions; standardising outcome measures; and conducting economic analyses.

Recommendations

The authors of this rapid review recommend that the NSW Drug and Alcohol Population and Community Programs apply three principles, activated with four sequential steps, in order to align its planned activities with current best evidence practice and optimise its investment in programs for young people.

The three principles are:

1. *Be clear about the types of programs that are of most interest.* In general, school and web-based programs will access a relatively large number of young people, but they are unlikely to be effective for young people who are already at increased risk of AOD related harm. The implementation of a range of programs targeting different populations of young people is obviously desirable (and, as shown in this review, a range of different programs were identified in the literature), but where limited funding is available, it will be most effective if it focuses on programs that target a defined population.
2. *Ensure there is existing and strong community support for programs*. This principle reflects the most common theme that underpinned each of the programs identified and examined in this review: that successful programs are those that have strong community interest, engagement, leadership and sustainable funding. Again, given resource limitations, supporting programs with existing community support and operational budgets will be both a more efficient and sustainable use of funds.
3. *Support more rigorous evaluation of programs*. This review identified only one community-based level 1 or 2 (best practice) evaluation. At present, studies are either strong on evaluation or strong on community engagement, but not both. A more rigorous evaluation would address the current limitations identified by the gap analysis in this rapid review:

- Develop an evidence-based assessment process that could be used routinely by service providers to both define the risk factors of high-risk young people more precisely and standardise outcome measures
- Achieve greater consistency across programs
- Undertake process, outcome and economic analyses (consistent with the NSW Government Program Evaluation Guidelines).

The authors also recommend that these three principles be activated with four sequential steps:

1. *Determine the specific focus of investment.* Specifically, whether the preference is to support school-based or web-based primary prevention programs, or community-based, targeted programs for Aboriginal young people at high-risk of AOD harm.
2. *Identify researchers or other evaluators with relevant and demonstrated expertise in conducting rigorous process, outcome and economic evaluations in real-world settings with service providers*. This could be a transparent and rigorous Expression of Interest (EOI) process.
3. *Identify existing community-based programs relevant to the specific focus of the investment (i.e. school-based programs or community-based programs for high-risk young people)*. The authors of this rapid review are aware of a number of existing such programs and relevant organisations in metropolitan, rural and remote communities in NSW (e.g. BackTrack [Armidale], Ted Noffs [Sydney], Maranguka [Bourke, Condobolin], so these programs exist and would be readily identifiable. This could be a task for the evaluation team selected through the EOI process.
4. *Support a partnership between the evaluation team selected through the EOI process and the participating community-based programs.* The purposes of the partnership would be:
    - Address the current gaps in knowledge identified in the gap analysis
    - Create a sustainable network of services and researchers that can be increased over time
    - Leverage an initial investment through other funding sources, such as ARC Linkage grants, NHMRC Partnership grants and private sector funding.

Background

Although fewer Aboriginal people drink than those in the general population, Aboriginal people experience a disproportionate amount of harm from alcohol and drug use, and are over-represented in most risk indicators. Aboriginal people are over-represented in the criminal justice system and in alcohol and drug treatment services with 15% of all clients reported to be Aboriginal in 2014-15.[8] Illicit drug use is associated with a number of health impacts and social harms that disproportionately affect Aboriginal and Torres Strait Islander people. These harms include increased risk of contracting hepatitis C and human immunodeficiency virus (HIV) from injecting drug use, higher levels of psychological distress and an increased risk of suicide. Illicit drug use is also linked with social issues, such as harms to children and family, violence, crime and incarceration.[9]

New South Wales Drug and Alcohol Population and Community Programs (DAPCP) wish to develop an Alcohol and Other Drug (AOD) prevention, early intervention and/or harm reduction program for young people at risk of AOD related harm, located in metropolitan, rural and regional locations in NSW. The aim is to develop a primary and/or secondary prevention program based in the community or in justice settings, rather than an individual treatment focus in clinical settings. While a population-based approach is ideal, only some interventions will be feasible within the project's budget and time constraints; others, for example, those with a primary focus on school-based interventions and policy-based interventions (e.g. alcohol advertising regulation, alcohol and tobacco minimum age restrictions, and taxation and minimum pricing) may not be feasible.

An evidence check was commissioned to find out how to best achieve the greatest AOD related outcomes for the target population. Specifically, an evidence check was required to identify the most effective interventions to reduce the risk of AOD related harm among at-risk Aboriginal young people. The evidence check review questions are:

1. For at-risk Aboriginal young people, what types of community-based and justice-based AOD interventions have been shown to be the most effective in promoting protective factors or reducing risk factors to prevent AOD related harm?
2. For the interventions identified in Q1, what were the critical factors for successful implementation and sustainability?

Methods

An accredited librarian working at a leading Australian university assisted with the review of both peer-reviewed and grey literature.

Peer-reviewed literature

An exploratory search was carried out in the following databases and selected references were downloaded: Scopus/Elsevier and PubMed Clinical Queries. The research team discussed the findings of this preliminary search strategy with the commissioning agency and made minor refinements to the key terms. With agreement from the agency, the scope of the initial search was widened to include:

1. Evidence about effective interventions for young Aboriginal populations for other health or social issues (e.g. effective sexual health interventions targeting at-risk Aboriginal young people)
2. Evidence about effective AOD interventions in vulnerable, young non-Indigenous Australian populations (for example, young homeless; in youth justice settings; socially, educationally or financially disadvantaged; geographically isolated)
3. Evidence about effective AOD interventions for Indigenous nationalities in other relevant countries (New Zealand, Canada).

Database search

A comprehensive search was completed using the databases: Medline (including Epub Ahead of Print, In-Process & Other Non-Indexed Citations)/Ovid; Embase/Ovid; PsycINFO/Ovid; EBM Reviews - Cochrane Database of Systematic Reviews/Ovid; CINAHL/Ebsco; Global Health/Ovid; ATSI Health/Informit; APAIS-ATSIS/Informit; Indigenous Studies Bibliography: AIATSIS/Informit.

Search strategy

The databases were searched with the terms below (and their corresponding subject headings in each database where specialised thesauri existed):

1. Indigenous OR Aborigin* OR "Torres Strait Island"* OR Inuit OR Maori OR "First Nation"* OR Metis OR "Native American"* OR "American Indian"* OR "Native Hawaiian"
2. adolescen* OR youth* OR young people OR young adult* OR child* OR teenage* OR juvenile*
3. alcohol or alcohol drinking OR tobacco OR tobacco smoking OR nicotine OR illicit drugs OR substance abuse OR substance misuse OR drug abuse OR polydrug use OR injecting drug use OR cannabis smoking OR marijuana OR opioids OR opiates OR heroin OR methadone OR inhalant abuse OR gasoline OR petroleum OR petrol sniffing OR amphetamine OR methamphetamine OR stimulants OR psychoactive drugs OR hallucinogens OR designer drugs OR street drugs OR pharmaceutical drug misuse
4. intervention OR counselling OR prevention OR treatment OR support OR therapy OR health care access OR referral OR program* OR policy OR policies OR social services OR family health OR rehabilitation OR diversion OR harm reduction OR harm minimisation OR early intervention OR peer led intervention
5. population-based OR (justice OR correctional) settings
6. 4 or 5
7. outcome measure* OR program indicator* OR program effectiveness OR program evaluation OR program efficacy OR program impact OR policy evaluation OR evaluation

8. Australia OR Canada OR USA OR New Zealand
9. 1 AND 2 AND 3 AND 6 AND 7 AND 8

The results were limited to English language studies published from January 2007 to March 2017. The Medline search is reproduced in the Appendix.

Expert search strategy

The research team also contacted several experts working in the field for additional references.

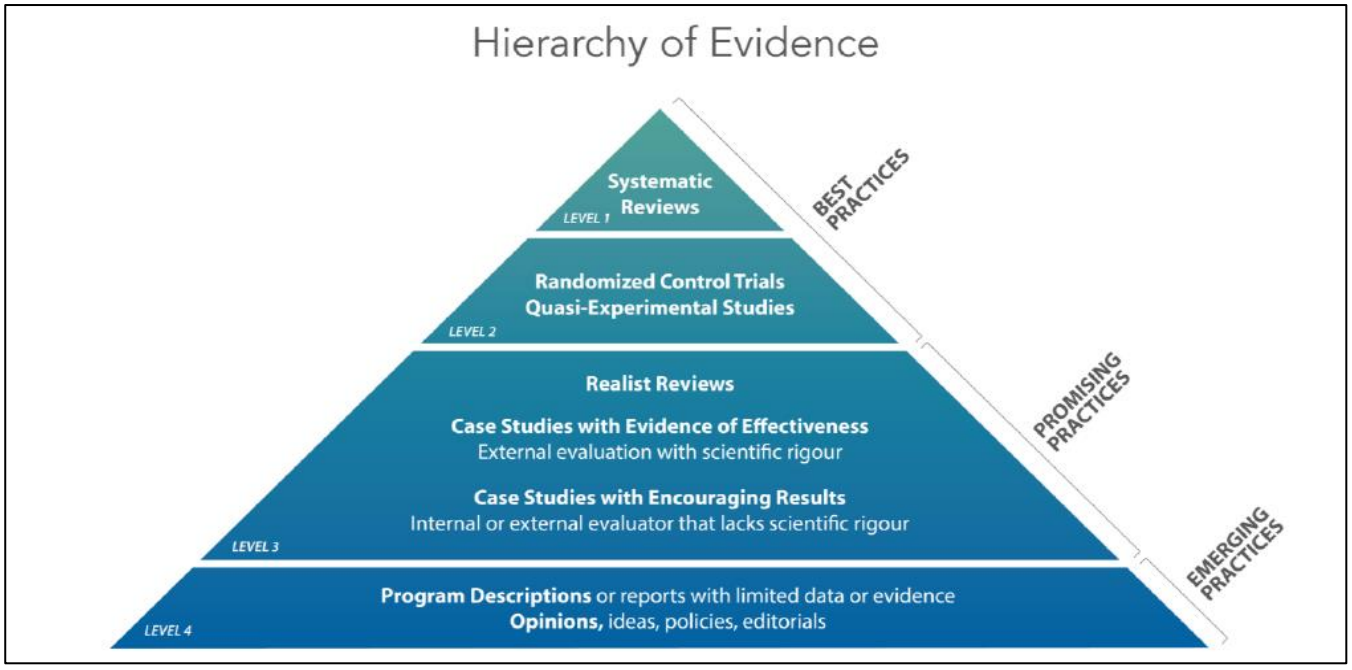
Quality assessment

Assessment of the quality of articles was undertaken using the Canadian hierarchy of promising practices evidence (Figure 1).[10] The hierarchy outlines three categories (and four levels) of evidence ranging from best practices and promising practices through to emerging practices.

Best practice (level 1 and 2) is an intervention, method or technique that has consistently been proven effective through the most rigorous scientific research. To be a 'best practice', there is a sufficient body of evidence that allows us to confidently say that the described practice is a generalisable example of something that works. It should be noted that some interventions might demonstrate scientific rigor, but never be generalisable in other contexts. An intervention that is generalisable within a specific context should also have merit as a best practice.

An intervention is considered to be a promising practice (level 3) when there is sufficient evidence to claim that the practice is proven effective at achieving a specific aim or outcome, consistent with the goals and objectives of the activity or program. Ideally, promising practices demonstrate their effectiveness through the most rigorous scientific research, however there is not enough generalisable evidence to label them 'best practices'. They do, however, hold promise for other organisations and entities that wish to adapt the approaches based on the soundness of the evidence.

Emerging practices (level 4) are interventions that are new, innovative and which hold promise based on some level of evidence of effectiveness or change that is not research-based and/or sufficient to be deemed a 'promising' or 'best' practice. In some cases, this is because an intervention is new and there has not been sufficient time to generate convincing results. Nevertheless, information about such interventions is important because it highlights innovation and emerging practices worthy of more rigorous research.



Source: Canadian Homelessness Research Network[10]

Figure 1: Hierarchy of promising practices evidence

Grey literature

In addition to the search of the peer-reviewed literature, 15 websites and clearing houses were scanned for reports related to the effectiveness of AOD interventions for at-risk Aboriginal Australian youth. The search criteria, including keywords and quality assessment, were as per the peer-reviewed search outlined above. Relevant results were selectively downloaded from: Lowitja Institute; Australian Policy Online; Learning Ground; Indigenous Justice Clearinghouse; Department of Health; NSW Health; Virginia Commonwealth University Drugs and Alcohol Resources; Google; Closing the Gap clearinghouse; and HealthInfoNet Australian Indigenous Alcohol and Other Drugs Knowledge Centre. The following websites were searched but no resources were downloaded: PsycEXTRA; Curtin Indigenous Research Centre; The National Collaborating Centre for Aboriginal Health (Canada); American Indian Health (US); Maori Health (NZ).

Results

Peer-reviewed search results

In total, 554 references of peer-reviewed studies were identified. Papers were excluded if they: (a) were duplicates (n=134); or, (b) did not pertain to effectiveness of AOD interventions (or a like term) in the abstract of journal articles (n=331). In all, 465 references were excluded, leaving 89 references for full-text assessment. Out of 89 full-text articles 51 were excluded because they did not pertain to Indigenous populations; or vulnerable youth; were not intervention studies; not on substance use; or full texts were not accessible. 38 studies from Australia (n=15), US (n=16), New Zealand (n=3) and Canada (n=4) were included in the final peer-reviewed synthesis and analysis (Figure 2).

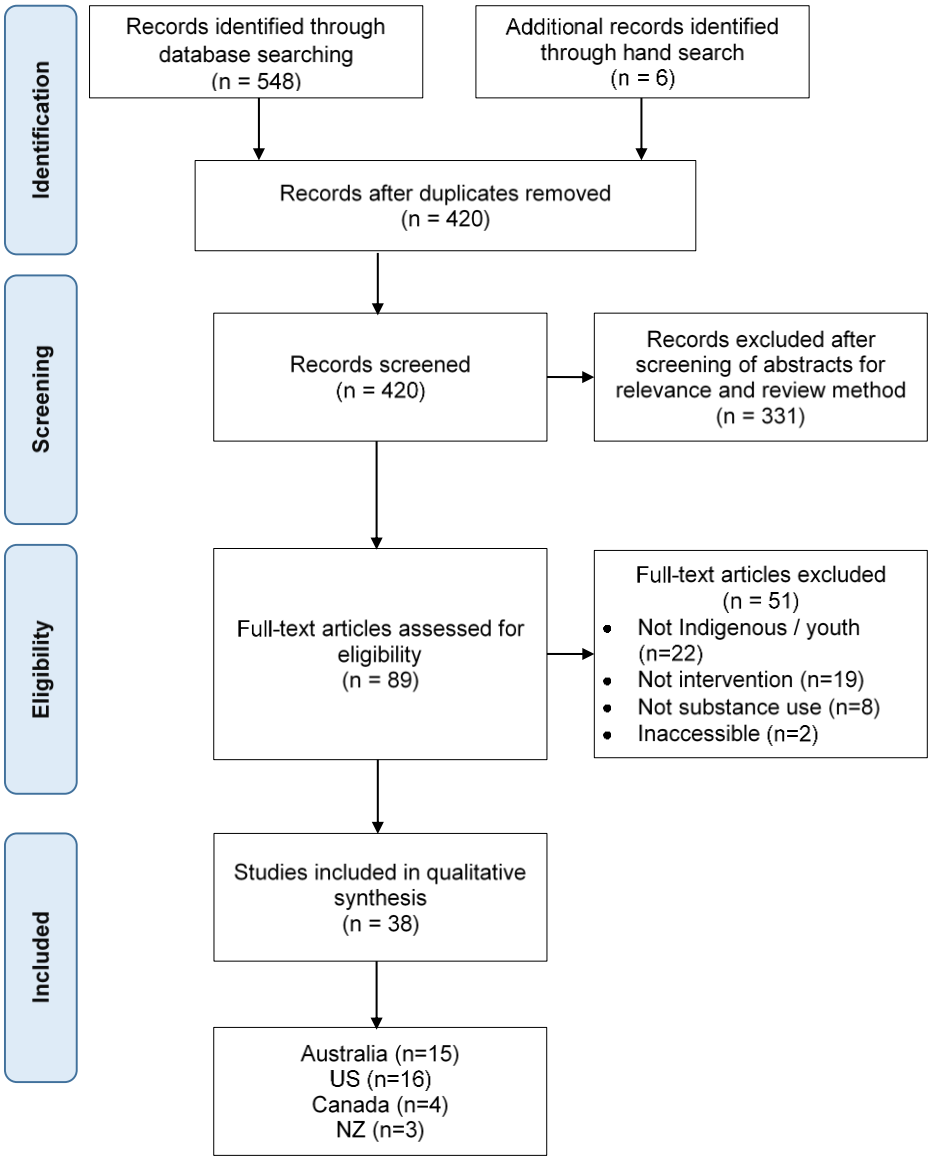


Figure 2: Peer-reviewed literature search

Studies with best practice evidence (level 1 and 2)

Table 2 provides an overview of the 12 studies that met the criterion for best practice evidence (level 1 and 2). For each study, the table provides information on the objective, method and key findings. In addition to the table, a brief summary is provided for each study according to whether it was focused on: Indigenous youth (seven studies), vulnerable youth (two studies); or Indigenous populations (three studies). Further discussion on the type and characteristics of effective interventions is provided below in response to review questions 1 and 2.

Indigenous youth studies

In a Cochrane Review, Carson et al.[11] evaluated the effectiveness of intervention programs to prevent tobacco use initiation or progression to regular smoking among young Indigenous populations. The review searched for studies up to November 2011. The authors found two studies published in 1987 and 1994. Both were Randomised Controlled Trials (RCTs) that used multi-component community-based interventions involving school forums for message delivery. At final follow-up, neither study detected statistically significant changes between intervention and control groups. The review highlights the paucity of data with which to evaluate tobacco prevention interventions for Indigenous youth from around the world.

Lee et al.[3] conducted a systematic review of interventions (published 1990-2011) to prevent or treat substance use among young Indigenous Australians. Eight published studies were found (most outside of the time frame of the current review, i.e. > 2007). Nearly all had major methodological limitations. Of the four projects that reported reductions in substance use, two included recreational or cultural activities and had strong community support, and one included supply control combined with employment opportunities. The authors suggest that ongoing partnerships between whole communities, local services and researchers are likely to be key in the development, implementation and evaluation of strategies to tackle substance use.

Johnson et al.[12] tested the efficacy of a school-based drug prevention curriculum (Think Smart) to reduce use of harmful legal products (HLPs such as inhalants and over-the-counter drugs) and AOD among Grades 5 and 6 students in Alaska. The study used a two-group, randomised, matched-control trial with nested repeated measures and reported a decrease in students' use of HLPs over a 30-day period at the six-month follow-up assessment, with no effects on other drug use. The authors suggest that HLP use was not mediated by the measured risk and protective factors that have been promoted in the prevention field.

Kypri et al.[13] tested the effectiveness of web-based alcohol screening and brief intervention (e-SBI) for reducing hazardous drinking among Maori university students. This is a relatively novel study whereby the intervention group received, among other things, personalised feedback on their drinking with an explanation of the associated health risk and information about how to reduce that risk. Five months after randomisation, participants were sent a hyperlink to a web-based follow-up questionnaire. Relative to controls, participants receiving the intervention drank less often, less per drinking occasion, less overall and had fewer academic problems.

McKennitt et al.[14] conducted a pilot study using a RCT design to ascertain the extent to which a modified school-based program had on future smoking intentions among American Indian children. The study involved 18 Indigenous students in Grade 4. Two schools were randomised to either a culturally sensitive or a standard smoking prevention program. Cultural aspects to the intervention were designed in partnership with the local Indigenous community to ensure consistency with local cultural norms. The authors found a significant reduction in intentions to smoke among Indigenous children who received the culturally sensitive smoking prevention program.

Okamoto et al.[15] conducted a pilot study to evaluate the Ho'ouna Pono curriculum, which is a culturally grounded, school-based drug prevention curriculum tailored to rural Native Hawaiian youth. Building on previous work, drug offer situations and culturally specific refusal strategies described by the youth in the pre-prevention study were translated into short, narrative film scripts that were validated in a series of focus groups with the Hawaiian youth. The scripts were used to produce professional-grade short films depicting drug offer situations in rural Hawaii, and youths' use of culturally specific refusal strategies within each situation. Refusal strategies used in response to

these types of offers reflected three categories – refuse, explain and angry refusal. The Ho'ouna Pono short films serve as the core components of the curriculum, and are used as the foundation for the classroom-based lessons focused on resistance-skills training. Six schools were randomly assigned to intervention (n=83 students) or control (n=130 students). The authors suggest that the curriculum was effective in maintaining youths' use of culturally relevant drug-resistance skills, as well as decreasing girls' aggressive behaviours, at six month follow up. Unanticipated findings also suggested areas for curricular improvement, including more emphasis on normative drug education.

Kulis et al.[16] described a small efficacy trial of the Living in 2 Worlds (L2W) substance use prevention curriculum for urban American Indian (AI) middle school students. L2W was implemented through a community-based participatory research (CBPR) approach. The L2W curriculum was delivered in two schools (n=85); the comparator school received the Keeping it Real (kiR) program (n=22). Results suggest that evidence-based substance use prevention programs that are culturally adapted for urban American Indian adolescents, such as L2W, can be a foundation for prevention approaches to help delay initiation and slow increases in substance use.

Vulnerable youth studies

Calabria et al.[1] conducted a systematic review of interventions (published 2005–2009) delivered outside educational settings, designed for young people (aged 11-25) with existing alcohol use problems. Nine intervention studies were included: nine counselling-based interventions and one medically-based intervention. The authors reported that none of the included intervention studies had consistently strong methodology. The most promising approaches to reduce alcohol-related harm are cognitive-behavioural therapy (CBT), family therapy and community reinforcement. The authors note that evaluations using more rigorous methodologies are required before clear conclusions can be reached about the most effective interventions to reduce alcohol-related harms among vulnerable youth.

A recent systematic review conducted by Knight et al.[4] sought to identify evaluations of interventions that target multiple risk factors in high-risk young people, describe their characteristics, critique their methodological quality and summarise their effectiveness. The authors found very few outcome evaluation studies of interventions that targeted multiple risk factors, relative to single risk factors among high-risk young people. Of the 13 identified studies – six were school, two health and five community-based; of which half were methodologically weak. Only one of the five community-based interventions achieved a methodological quality rating higher than weak. The strongest community-based intervention involved apprenticeship-focused training for juvenile offenders aged 15-18. The training resulted in statistically significantly improved rates of self-reported employment and educational outcomes.[17] The authors note that more methodologically rigorous evaluations of interventions targeting multiple risk factors among high-risk young people are required, especially for those delivered in community settings.

Indigenous studies

Jiwa et al.[18] conducted a literature search (published 1975-June 2007) to understand the development of culturally based and community-based alcohol and substance abuse treatment programs for Indigenous patients. The search produced 34 articles with most of the literature being opinion pieces and program descriptions (level 3 evidence). The authors note that community-based addictions programs are appropriate alternatives to treatment at distant residential addictions facilities. The key components of success are strong leadership in this area, strong community member engagement, funding for programming and organizing, and the ability to develop infrastructure for long-term program sustainability.

Calabria et al.[2] conducted a systematic review of family-based interventions (published 2003–2010) targeting alcohol misuse and their potential to reduce alcohol-related harm in Indigenous communities. All 19 family-based interventions identified in the review were counselling-based: 11 included involving family members in the treatment of problem drinkers and eight studies specifically targeted family members of problem drinkers. Although an encouraging 18 of the 19 family-based interventions yielded a positive effect, methodological

deficiencies resulted in less than optimal evidence. The authors noted that the most effective programs identified by the review are community reinforcement and family training, coping skills training and 12 step facilitation.

Glover et al.[19] used an RCT design to investigate whether pregnant Maori women (aged 16 and over) who smoke are more likely to abstain from smoking if given products or vouchers. Participants were randomised to three groups: control; retail voucher to the value of NZ$25 for each 'abstinent from smoking' week for eight weeks (voucher); or product to the value of NZ$25 for each 'abstinent from smoking' week for eight weeks (product). Overall 21% (n=5) of the women abstained from smoking for at least six of the eight weeks: one from control, six from product, three from voucher. Authors noted that incentives might be an effective addition to usual care to increase smoking cessation among pregnant Maori women.

Table 2: Studies with best practice evidence (level 1 and 2)

First author, year, country	Objective	Sample size, setting	Design	Intervention/methods	Findings	Quality rating
Indigenous youth studies						
Carson, 2012, Australia	To evaluate the effectiveness of intervention programs to prevent tobacco use initiation or progression to regular smoking among young Indigenous populations and to summarise these approaches for future prevention programs and research	Intervention studies aiming to prevent tobacco use initiation or progression from experimentation to regular tobacco use in Indigenous youth	Cochrane review	The Cochrane Tobacco Addiction Group Specialised Register was searched in November 2011, with additional searches run in MEDLINE. Online clinical trial databases and publication references were also searched for potential studies	Information from the two included studies in this review does not allow a conclusion to be drawn as to whether tobacco prevention programs in Indigenous populations work	Level 1: best
Lee, 2013, Australia	To examine peer-reviewed evaluations of interventions designed to prevent or treat substance use among young Indigenous Australians	Interventions designed to prevent or treat substance use among young Indigenous Australians	Systematic review of articles published 1990-2011 (inclusive)	Eight electronic databases	Eight studies met inclusion criteria: five studies were evaluations of 'universal programs' aimed at a broad population of young people; three studies were evaluations of 'targeted programs' (TP) aimed at young people with a problem	Level 1: best
Johnson, 2009, US	Efficacy of a school-based drug prevention curriculum (Think Smart), designed to reduce use of Harmful Legal Products (HLPs, such as inhalants and over-the-counter drugs), alcohol, tobacco, and other drugs among Grades 5 and 6 students in frontier Alaska	496 students of 606 enrolled in 2006 (88%) and 462 students of 610 enrolled in 2007 (84%) were eligible; student response rates were 76% (Wave 1), 66% (Wave 2), and 70% (Wave 3); school based	A two-group, randomised, matched-control trial with nested repeated measures	The curriculum consisted of 12 core sessions and three booster sessions administered two–three months later, and was an adaptation of the Schinke life skills training curriculum for Native Americans	Think Smart curriculum produced a decrease in the proportion of students who used HLPs over a 30-day period at the six-month follow-up assessment, no effects on other drug use. The direct effect of HLPs use was not mediated by the measured risk and protective factors that have been promoted in the prevention field	Level 2: best

First author, year, country	Objective	Sample size, setting	Design	Intervention/methods	Findings	Quality rating
Kypri, 2012, NZ	Tested the effectiveness of web-based alcohol screening and brief intervention (e-SBI) for reducing hazardous drinking among Maori university students.	1789 hazardous or harmful drinkers – 850 to control, 939 to intervention; seven of New Zealand's eight universities	Parallel, double-blind, multi-site, randomised controlled trial	Those screening positive were computer randomised to < ten minutes of web-based alcohol assessment and personalised feedback (intervention) or screening alone (control)	Relative to controls, participants receiving intervention drank less often, less per drinking occasion, less overall and had fewer academic problems	Level 2: best
McKennitt, 2012, US	The aim of this pilot study was to collect preliminary information on the extent to which a modified school-based program would have short-term impacts on future smoking intentions among Aboriginal children	18 Aboriginal students (Grade 4) across two schools	Two schools were randomised to either a culturally sensitive or a standard smoking prevention program; pre-post survey	The standard program provided statistics on smoking among youth, outlined peer pressure refusal strategies and emphasised harmful chemicals in cigarettes. The culturally sensitive program began with a traditional Aboriginal smudge ceremony followed by a discussion of the harmful chemicals in commercial tobacco, unhealthy consequences of tobacco use and peer pressure refusal strategies	A standard smoking prevention program that was culturally adapted for Aboriginal children significantly reduced intentions to smoke among Aboriginal students in Grade 4	Level 2: best
Okamoto, 2016, US	This pilot study examined the effectiveness of a novel, culturally grounded, school-based drug prevention curriculum for rural Hawaiian youth	Six schools were randomly assigned to either an intervention or control; 83 students received intervention, 130 control; mean age = 11.7 years	RCT: Three waves of data (pre-test, post-test, and six month follow up)	Ho'ouna Pono (meaning "to send with righteousness") is a school-based, culturally grounded drug prevention curriculum – seven 45 minute lessons primarily focused on resistance skills training	Findings suggest that the curriculum supports the continued use of this resistance strategy; the curriculum should be further developed to incorporate additional content related to the health consequences of substance use and normative drug education	Level 2: best
Kulis, 2017, US	Describes a small efficacy trial of the Living in 2 Worlds (L2W) substance use prevention curriculum for urban American Indian (AI) middle school students	107 participants were AI youth in Grades 7 or 8 who were enrolled in three urban middle schools	RCT: two schools delivered the L2W curriculum, the comparator school implemented the Keeping it Real (kiR) curriculum	L2W is a culturally adapted version of Keeping it Real (kiR) - focused on strengthening resiliency and AI cultural engagement, L2W teaches drug resistance skills, decision making, and culturally grounded prevention messages	Results suggest that evidence-based substance use prevention programs that are culturally adapted for urban AI adolescents, like L2W, can be a foundation for prevention approaches to help delay initiation and slow increases in substance use	Level 2: best

First author, year, country	Objective	Sample size, setting	Design	Intervention/methods	Findings	Quality rating
Vulnerable youth studies						
Calabria, 2011, Australia	To conduct a review of published studies evaluating interventions delivered outside educational settings, designed for young people with existing alcohol use problem	Interventions delivered outside formal educational settings, designed for young people	Systematic review of articles published 2005–2009 (inclusive)	Ten electronic databases; quality assessed using the Dictionary for the Effective Public Health Practice Project Quality Assessment Tool for Quantitative Studies	Nine intervention studies were included: eight counselling-based interventions and one medically-based; none of the included intervention studies had consistently strong methodology	Level 1: best
Knight, 2016, Australia	To identify evaluations of interventions that target multiple risk factors in high risk young people, describe their characteristics, critique their methodological quality and summarise their effectiveness	Students, schools, urban adolescents, juvenile offenders, unemployed homeless young people, young people in foster care	Systematic review	Review of both peer-reviewed and grey literature – methods consistent with Cochrane Collaboration Handbook on Systematic Reviews of Health Promotion and Public Health Interventions	13 intervention studies: six school, two health, five community. There are four common elements that these successful programs have: i) they are multi-component (i.e. deliver more than one strategy); ii) they use motivational interviewing techniques; iii) they use cognitive behaviour therapy techniques; iv) they have work-skills development and case management activities	Level 1: best
Indigenous studies						
Calabria, 2012, Australia	Systematic review to identify published evaluations of family-based alcohol interventions in Indigenous communities	Family-based alcohol interventions in Indigenous communities	Systematic review of articles published 2003–2010 (inclusive)	11 electronic databases; quality assessed using the Dictionary for the Effective Public Health Practice Project Quality Assessment Tool for Quantitative Studies	19 studies: 11 included family members in the treatment of problem drinkers, eight targeted family members; 18 of the 19 family-based interventions yielded a positive effect; methodological deficiencies in evaluation designs across all studies resulted in less-than-optimal evidence	Level 1: best

First author, year, country	Objective	Sample size, setting	Design	Intervention/methods	Findings	Quality rating
Jiwa, 2008, Canada	A search was undertaken to identify literature on community-based substance abuse services for Aboriginal communities in an international context	Alcohol and drug addictions programs for Aboriginal communities	Review of articles published 1975-June 2007	MEDLINE, HealthSTAR, and PsycINFO databases were searched; used three levels of evidence to grade quality	34 articles identified with most being opinion pieces and program descriptions. Literature on community-based addictions programs emphasises the importance of viewing drug and alcohol addictions through a sociocultural lens. The models attempt to address the problem at the community level through grassroots efforts to enhance community empowerment and mobilisation	Level 1: best
Glover, 2015, NZ	To investigate if pregnant Indigenous NZ women who smoke are more likely to abstain from smoking if given products or vouchers (i.e., incentives)	24 consented and were randomised (eight in each group); mean age =25 years old (±2.25); community setting	Feasibility RCT	Participants were randomised to receive (1) usual cessation support (control), (2) usual cessation support plus a retail voucher to the value of NZ$25 for each 'abstinent from smoking' week for eight weeks (voucher), or (3) usual cessation support plus product to the value of NZ$25 for each 'abstinent from smoking' week for eight weeks (product)	21% (n=5) of the women were abstinent from smoking for at least six weeks of the eight, one from the control, six from the product and three from the voucher. Incentives may be an effective addition to usual care to increase smoking cessation among pregnant Maori women	Level 2: best

Studies with promising practice evidence (level 3)

Table 3 provides an overview of the 19 studies that met the criteria for promising practice evidence (level 3). In addition to the table, a brief summary is provided for each study according to whether it was focused on: Indigenous youth (15 studies), vulnerable youth (one study) or Indigenous populations (three studies). Further discussion on the type and characteristics of effective interventions is provided below in response to review questions 1 and 2.

Indigenous youth studies

Mashquash et al.[20] described the development of, and pilot results for, an alcohol abuse early intervention program targeting at-risk Canadian Mi'kmaq youth conducted in partnership with the community and school. The authors modified an existing intervention based on a psychoeducational and CBT approach. The culturally adapted intervention included traditional Mi'kmaq knowledge and teachings in order to make the program as meaningful and relevant as possible in the partner communities. A key foundation was the emphasis on the journey inward toward personal gifts of the Spirit and the power of self-healing.

An important addition to the CBT strategies used within the intervention was the inclusion of traditional sacred Medicine Wheel teachings. While the focus of the intervention was on a greater wholeness; the Medicine Wheel helped to convey the aspects of personality being taught in the psychoeducational portion of the intervention. The commonalities between certain aspects of the cognitive-behavioural model (i.e. relationships between thoughts, feelings, and behaviours) and the Medicine Wheel, prepared the youth for the cognitive-behavioural exercises, which were designed to help keep the various aspects of personality in balance (e.g. balance between thoughts and feelings) – an important teaching shared from the Medicine Wheel. Results suggested that, compared to pre-intervention, intervention participants drank less, engaged in less binge-drinking episodes, had fewer alcohol-related problems, were more likely to abstain from alcohol use and reduced their marijuana use. No such significant changes were observed in the control group. The authors noted that community acceptance of the intervention was in large part due to the communities' identification that alcohol misuse was an issue for their adolescents.

Lee et al.[21] examined the effectiveness of a community-driven youth initiative to prevent substance misuse and increase respect for culture and Elders among young people in a group of remote Indigenous Australian communities in Arnhem Land. The initiative was the development of the Youth Development Unit (YDU) that offers programs to all young people in recreation and training opportunities, skill development and improved connectedness. Perceived achievements included promoting skills of Indigenous community members, enhanced inter-agency communication and an increased range of youth activities. Community members felt the YDU had the potential to reduce youth problems; including substance misuse, and to increase respect for Elders and culture. The authors suggested that further research is needed to assess the longer-term impact in reducing substance misuse and mental health disorders.

Clough et al.[22] described the processes and early outcomes of a diversion program for Indigenous youth in the Northern Territory (NT). 35 young people (aged 11-18 years) were diverted from criminal justice and referred to a community-based diversion initiative that involved counselling and referrals to a local Indigenous mental health worker program, community work and activities, training and education and retribution. By July 2006, 25 had completed the program; only one client re-offended after completing diversion. The authors noted that a high completion rate was achieved despite a dearth of locally available drug and alcohol treatment services and diversion options, shifts in police approaches, heavy administrative burdens to meet legal requirements and difficulties communicating across cultural barriers.

Charlier et al.[23] described lessons learned from the implementation of the Keeping Kids Smokefree (KKS) study. KKS is a quasi-experimental trial about community participation of a study aimed at reducing the uptake of smoking

among pre-adolescents in a community with a high percentage of Maori and Pacific Island people. The intervention involved students, parents, school teachers and management, extended families and members of the wider community. In this paper, no specific outcomes are measured. Barriers, recommendations and facilitators of community participation are discussed and are elaborated further in response to review question 1.

McGrath et al.[24] conducted an evaluation of the process and outcome of a culturally targeted health promotion program for US Pacific Islander youth who are at risk for co-occurring problem behaviors, including risky sexual behaviour, substance abuse, and interpersonal violence. The intervention, Project Talanoa, was developed around four constructs: cultural identity and pride, teen health, peer relations, and family ties. The program was pilot tested and evaluated by 24 Pacific Islander adolescents (ages 12–15 years). The findings indicated that it was culturally appropriate, well-liked by the participants, supported by parents and others in the community, and found to be feasible. The authors noted that further research was needed to test for effectiveness.

Gilder et al.[25] examined the acceptability of the use of motivational interviewing (MI) to reduce underage drinking in a Native American community. MI is a brief psychotherapeutic intervention technique that assesses a patient's readiness to change (or stage of change) and implements a treatment program specific to his or her stage of change. 36 tribal leaders were interviewed after receiving an hour-long session on underage drinking. The results suggested that: a substantial proportion of reservation youth would be willing to accept MI for behaviour change, relatively few are actually ready to change, and MI may be well suited as an intervention to prevent underage drinking in that population.

Nelson et al.[26] evaluated the effectiveness of Native Voices, a five year HIV/AIDS, substance abuse, and hepatitis prevention program for urban American Indian and Alaska Native people. The intervention was the four day GONA (Gathering of Native Americans) curriculum that offers skills and knowledge in a way that embraces traditional Indigenous cultures and provides a foundation for community advocacy and community capacity building. The findings indicated that knowledge, perception of risk, and sexual self-efficacy increased, while no change was shown in measures of ethnic identity and behaviour.

Henry et al.[27] conducted a research study to develop a method for quantifying intervention exposure in community-based participatory research (CBPR) interventions that differ in their forms across communities, permitting multi-site evaluation. The project is part of a long-term collaboration between community and researchers that has developed a universal preventive intervention designed to promote protection from suicide and alcohol abuse among Alaskan Native youth. The basis of the study is the Qungasvik, a Yup'ik word meaning toolbox. The Qungasvik is a compendium of cultural activities that serve as a starting point in the development of interventions contextualised to customs and history of each local community, built around the same protective factors. The authors suggested that standardising interventions by the functions an intervention serves (protective factors promoted) instead of their forms or components (specific activities) can assist in refining CBPR interventions and evaluating effects in culturally distinct settings.

Moore et al.[28] implemented a reward and reminder underage drinking prevention program in convenience stores near Southern California American Indian reservations. The project was initiated as a collaborative effort to reduce underage drinking in a community tribal health clinic that serves a consortium of local tribes. It involved decoys (volunteers over 21 years of age) attempting to purchase alcohol without identification. Clerks who asked for identification were given "rewards" (gift cards and congratulatory letters), whereas clerks who did not were given "reminders" of the law regarding sales to minors. Baseline sales rate without requesting ID was 33%, however in the following two reward and reminder rounds, 0% of the stores failed to request identification. The authors suggested that environmental community level underage drinking prevention strategies to reduce alcohol sales near rural reservations are feasible and can be effective.

Kulis et al.[29] examined changes in the drug-resistance strategies used by urban American Indian (UAI) middle school students during a pilot test of a substance use prevention curriculum. This is an earlier study of Kulis et al.[16] Living in 2 Worlds (L2W) teaches four drug-resistance strategies (refuse, explain, avoid, leave [R-E-A-L]) in culturally

appropriate ways. 12 lessons of the L2W curriculum were delivered over five months. The authors note that the study was not designed to assess the effect of L2W on actual substance use rates; it examined only short-term results on the use of drug-resistance strategies, with promising results.

Helm et al.[30] outlined a collaboration between communities on Hawaii and a university-based research team to develop, implement, and evaluate a school-based substance use prevention curriculum called Ho'ouna Pono. The Helm team study focused on intervention development through an iterative process using an eco-developmental approach to defining etiology and risk and protective factors. As part of curriculum development, youth participated in focus group discussions for the purpose of adapting and validating video scripts to make them more realistic. Results from this pilot informed the larger study undertaken by Okamoto et al.[15] and outlined above.

Mohatt et al.[5] examined the feasibility of a community intervention for the prevention of suicide and alcohol abuse with Yup'ik Alaska Native youth: the Elluam Tungiinun (Toward Wellness; ET) and Yupiucimta Asvairtuumallerkaa (Strengthening our Yup'ik Identity; YA) studies. Modules for each study were developed over 15 years of CBPR with Alaskan Native communities. 52 youth participated in the ET study (mean age 14.6 years), 25 females and 27 males; and 54 in the YA study (mean age 14.2 years), 31 females and 23 males. The ET project delivered 26 prevention modules and YA delivered 15 prevention modules over a total of 52 sessions with youth, families and the community. The results suggested that implementation in these rural Alaskan settings is feasible when sufficient resources are available to sustain high levels of local commitment. In such cases, measureable effects are sufficient to warrant a prevention trial. The authors noted that because of local concerns expressed regarding the potential impracticality and cultural inappropriateness of RCT designs, such a trial could make use of one of the promising quasi-experimental alternatives to RCTs such as dynamic wait-listed designs.

Beckstead et al.[31] conducted a pilot study to examine pre- to post-change of patients in a substance use residential treatment centre that incorporated dialectical behavior therapy (DBT) with specific cultural, traditional and spiritual practices for Alaskan Indian / Alaskan Native adolescents. DBT is an evidence-based medicine that teaches a core skill called mindfulness. Mindfulness can be the vehicle to incorporate traditional and spiritual practices into an evidence-based approach to mental health that utilises mindfulness as part of a manualised treatment. DBT was administered to 229 Alaskan Indian / Alaskan Native youth (12–18 years) youth in a residential treatment setting. Findings suggested that 96% of the youth were either recovering or improving at the time of discharge. Authors however, were unable to detect the specific contribution of the incorporation of DBT with the traditional, spiritual and cultural practices.

Donovan et al.[32] described and evaluated an intervention called Healing of the Canoe, developed through extensive CBPR and Tribal Participatory Research (TPR). The intervention aimed to promote increased cultural belonging and prevent substance abuse among tribal youth. The intervention was administered to eight school children through school curriculum and 23 youth through workshops. Participation in the intervention was associated with increased hope, optimism, and self-efficacy and with reduced substance use, as well as with higher levels of cultural identity and knowledge about alcohol and drugs among high-school-aged tribal youth. The authors suggested that these results provide preliminary support for the intervention curricula in promoting positive youth development, an optimistic future orientation and the reduction of substance use among Native youth.

Jainullabudeen et al.[6] evaluated the effects of a whole-of community, anti-binge drinking intervention for young people (18-24 year olds) in Yarrabah, an Indigenous Australian community in Far North Queensland. Called Beat da Binge, the strategy was community-driven and it actively engaged young people in its design, implementation and evaluation. Beat da Binge activities were implemented to coincide with two major community events and 12 minor community events each year. Beat da Binge resulted in significant reductions in short-term risky drinking and expenditure on alcohol; and significant increases in awareness of binge drinking and understanding of a standard drink. The CBPR approach underpinning the intervention is further described in McCalman et al.[7]

Vulnerable youth studies

Hannam[33] discussed the Youth Drug and Alcohol Court (YDAC). The YDAC offered a range of interventions to young people who were involved in the criminal justice system in NSW. Health services (including dental care) are provided to all young people on YDAC through the support of nurses, a part-time addiction specialist and a part-time psychiatrist. Most participants complete a residential drug rehabilitation program that generally lasts up to three months. Some participants undertake a day program; others, especially those attending school or carrying out paid employment, address their substance abuse issues through counselling in the community. Juvenile Justice offers specific programs, such as group or individual sessions, aimed at ending offending. Two TAFE teachers, based at the YDAC office, offer participants assistance with education, training and job searching.

Each participant is assigned a case manager from a non-government agency to assist with welfare-related issues. One of the case managers identifies as Indigenous. This relationship with non-government agencies is a special component of the YDAC. Many participants form strong, long-term relationships with their case managers; often these continue even after completion of the YDAC program. For 12 years, the YDAC played an important role in the NSW criminal justice system, offering offending youth with a demonstrable AOD problem a second chance in tackling drug- and alcohol-related offending: these findings were supported by an independent evaluation. In 2012, the state government defunded the program, citing funding.

Indigenous studies

Gray et al.[34] provided commentary on five research projects commissioned to enhance alcohol treatment among Indigenous Australians. The focus of these projects was on treatment services. While the impact of the projects varied, they highlight the feasibility of adapting mainstream interventions in Indigenous Australian contexts. Outcomes include greater potential to: screen for those at risk, increase community awareness, build capacity and partnerships between organisations, and co-ordinate comprehensive referral networks and service provision. The authors note that a small investment can produce sustainable change and positive outcomes.

Calabria et al.[35] described the perceived acceptability of two cognitive-behavioural interventions, the Community Reinforcement Approach (CRA) and Community Reinforcement and Family Training (CRAFT), to a sample of Indigenous Australians. CRA uses social, familial and recreational positive reinforcement to modify the behaviour of problem drinkers. CRAFT is a family-focused version of CRA and teaches practical skills to family members of treatment-resistant problem drinkers. Specifically, it aims to improve their own health and wellbeing and assist them to encourage their problem drinking relative into treatment. The results suggested that both interventions were highly acceptable for delivery in Indigenous Australian communities. CRA was deemed most acceptable for delivery to individuals after alcohol withdrawal and CRAFT for people who wanted to help a relative/friend start alcohol treatment.

Maksimovic et al.[36] evaluated the pilot phase of the Give Up Smokes for Good campaign. The campaign was South Australia's first ever Indigenous-focused anti-tobacco social marketing campaign that aimed to ensure that Indigenous people in the target geographical areas were aware of the harms associated with tobacco smoking and to encourage smoking-related behavioural change (i.e. choose not to smoke in homes and cars, make a quit attempt). Results suggested that the campaign was culturally appropriate and relevant.

Table 3: Studies with promising practice evidence (level 3)

First author, year, country	Objective	Sample size, setting	Design	Intervention / methods	Findings	Quality rating
Indigenous youth studies						
Mashquash, 2007, Canada	To develop and pilot test an alcohol abuse early intervention program targeting at-risk Mi'kmaq youth conducted in partnership with the communities and schools	Age 14-18; grade 8-12. 29 (20 females, nine males) presented for and received the interventions; 12 (six females, six males) were assigned as controls; school-based	Pre- to post-treatment changes with a control group	Intervention was based on a psychoeducational and cognitive-behavioral approach for at-risk adolescent drinkers. Adapted to be culturally appropriate by including traditional Mi'kmaq knowledge and teachings. Intervention occurred across two 90-minute sessions	Compared to pre-intervention, intervention participants drank less, engaged in less binge-drinking episodes (i.e., five drinks or more per occasion), had fewer alcohol related problems, were more likely to abstain from alcohol use and reduced their marijuana use. No such significant changes were observed in control group	Level 3: promising
Lee, 2008, Australia	Examines the role, methods and effectiveness of a community-driven youth preventive initiative, the Youth Development Unit (YDU) in reducing the risk of substance misuse and increasing resilience and connectedness in a group of Indigenous communities in Arnhem Land	Three Aboriginal communities in Arnhem Land; community populations range from 200 to 750, of whom 50-55% are aged 24 or younger	Mixed methods to assess acceptability and effectiveness in first 2 years of operation	YDU offers programs to all young people and also provides case management for juvenile diversion	Participants reported an increase in recreation and training opportunities, skill development and improved connectedness. Community members felt the Unit had the potential to reduce youth problems, including substance misuse, and to increase respect for elders and culture	Level 3: promising

First author, year, country	Objective	Sample size, setting	Design	Intervention / methods	Findings	Quality rating
Clough, 2008, Australia	Describe processes and early outcomes of a diversion program in the Northern Territory	35 young people (aged 11-18 years); diverted from criminal justice and referred to a community-based diversion initiative	Client assessment records and staff interviews were used to examine clients' diversion pathways and early program results	A community-based diversion initiative includes: counselling and referrals to local Aboriginal mental health worker program, community work and activities, training and education, and retribution	Case managers could provide information about the 35 diversion clients for periods from two to 60 week. A high completion rate (89%) was achieved despite: a dearth of locally available drug and alcohol treatment services and diversion options, shifts in police approaches, heavy administrative burdens to meet legal requirements and difficulties communicating across cultural barriers	Level 3: promising
Charlier, 2009, NZ	To describe lessons learned about community participation of a study aimed at reducing the uptake of smoking among pre-adolescents in a community with a high percentage of Maori and Pacific Island people	4000 students (and their parents) of four South Auckland schools were enrolled in the study over three years	A quasi experimental trial – non-random comparison of an intervention population with a matched control population	The intervention, Keeping Kids Smokefree (KKS) involves: promoting quit attempts among parents and teachers, health education for parents on how to reduce the chance their children will start smoking, reducing the supply of tobacco products to minor,; student involvement in the production of program materials, and health promotion events for students' families	No specific outcomes reported. Community participation reinforced importance of: (i) time commitment, (ii) similar cultural and ethnic backgrounds; (iii) collaborative partnerships to create strength and cohesion, and assist with clear articulation of the research project mission and objectives	Level 3: promising
McGrath, 2010, US	Evaluation of the process and outcome of a culturally targeted health promotion program for US Pacific Islander youth who are at risk for co-occurring problem behaviors, including risky sexual behavior, substance abuse, and interpersonal violence	Qualitative interviews, focus groups, participant observation, surveys, intervention pilot (24 Pacific Islander adolescents (12-15)	Mixed methods with Pacific Islander adults and youth	After identifying key cultural values and reviewing existing evidence-based prevention interventions, ''Project Talanoa'' was developed around four constructs: cultural identity and pride, teen health, peer relations and family ties	Results indicate it was culturally appropriate, well-liked by the participants, supported by parents and others in the community, and found to be feasible	Level 3: promising

First author, year, country	Objective	Sample size, setting	Design	Intervention / methods	Findings	Quality rating
Gilder, 2011, US	To survey tribal leaders / members in a Native American community about: a research program to assess the efficacy of individual and family MI interventions aimed at the prevention of underage drinking: and, the extent to which youth readiness to change might be associated with their acceptance of the MI intervention	36 Native American tribal leaders and members living on contiguous rural southwest California reservation (23 female)	A self-completed survey	Recruitment for the survey was initially undertaken from a group of tribal leaders/members who had previously completed an hour long face-to-face semi-structured ethnographic interview regarding the extent of underage drinking in their tribes and previous community efforts to define and reduce the problem	The results suggest: a substantial proportion of reservation youth would be willing to accept MI for behavior change; relatively few are actually ready to change; and, MI may be well suited as an intervention to prevent underage drinking in that population	Level 3: promising
Nelson, 2011, US	Evaluate the effectiveness of Native Voices, a five-year HIV/AIDS, substance abuse, and hepatitis prevention program for urban American Indian and Alaska Native (AI/AN) people living in the San Francisco Bay Area	The study group was composed of 100 youth (ages 13-18), community-based strategy	A mixed methods approach: pre-and post-survey design	The intervention was the 4 day GONA (Gathering of Native Americans) curriculum. event hosted by Native American Health Center. The GONA curriculum offers skills and knowledge in a way that embraces traditional Indigenous cultures and provides a foundation for community advocacy and community capacity building	The findings indicate that knowledge, perception of risk, and sexual self-efficacy increased, while no change was shown in measures of ethnic identity and behaviour	Level 3: promising
Henry, 2012, US	To develop a method for quantifying intervention exposure in CBPR interventions that differ in their forms across communities, permitting multi-site evaluation	156 youth aged between 12 and 17 (87 males and 69 females); 3 communities of the Yukon–Kuskokwim region of Southwest Alaska	Project is part of a long-term collaboration that has developed a CBPR intervention designed to promote protection from suicide and alcohol abuse among Alaska Native (AN) youth	Qungasvik, a Yup'ik word meaning "toolbox," is a prevention program toolkit providing very basic outlines for prevention activities the community can choose from and adapt. Each activity stresses one or more of 12 protective factors. The Qungasvik is a compendium of cultural activities that serve as a starting point in the development of interventions contextualised to customs and history of each local community, built around the same protective factors	Standardising interventions by the functions an intervention serves (protective factors promoted) instead of their forms or components (specific activities) can assist in refining CBPR interventions and evaluating effects in culturally distinct settings	Level 3: promising

First author, year, country	Objective	Sample size, setting	Design	Intervention / methods	Findings	Quality rating
Moore, 2012, US	Describe the results of a culturally tailored reward and reminder program to reduce alcohol availability to youths living on or near nine Southern California American Indian reservations	13 alcohol outlets close to tribes	Reward and reminder incentive study – observational	Decoys (volunteers over 21 years of age) attempted to purchase alcohol without ID. Clerks who asked for identification were given "rewards" (gift cards and congratulatory letters), whereas clerks who did not were given "reminders" of the law regarding sales to minors	Baseline sales rate without requesting ID was 33%. Similarly, 38% of stores in the first reward and reminder visit round failed to request identification. In the following two reward and reminder rounds, 0% of the stores failed to request identification	Level 3: promising
Kulis, 2013, US	Reports on a pilot test of a culturally adapted substance use prevention intervention designed specifically for urban American Indian (UAI) youth	57 participants were AI youth in Grades 7 or 8 (mean age = 12.5 years) enrolled in two urban schools in the Phoenix metropolitan area	A pre- and post-test survey; baseline, one month and seven months	A substance use prevention curriculum - Living in 2 Worlds (L2W). L2W teaches 4 drug resistance strategies (refuse, explain, avoid, leave [R-E-A-L]) in culturally appropriate ways. 12 lessons of the L2W curriculum were delivered over five months	The L2W curriculum appears effective in teaching culturally relevant communication strategies that expand UAI youths' repertoire of drug resistance skills	Level 3: promising
Helm, 2013, US	This article briefly outlines a collaboration among communities on Hawaii and a university-based research team to develop, implement, and evaluate a school-based substance use prevention curriculum called Ho 'ouna Pono	Public schools, include youth in middle school (Grades 6-8), sample size varied across four stages of the program	The current implementation phase is underway with a pilot study to determine feasibility and effect size of the proposed intervention (2012-2014)	Various stages/approaches used to develop intervention. Intervention schools participate in the video-enhanced curriculum; comparison schools participate in the standard health education curriculum. For the pilot test, seven lessons are delivered once weekly for seven weeks	Use results from pilot to improve the existing curriculum; plan to scale up the intervention to include more sessions (pilot phase includes seven sessions), as well as to use a larger sampling frame	Level 3: promising
Mohatt, 2014, US	The Elluam Tungiinun (ET) and Yupiucimta Asvairtuumallerkaa (YA) studies evaluated the feasibility of a community intervention to prevent suicide and alcohol abuse among rural Yup'ik Alaska Native youth in two remote communities	52 youth in ET study (mean age = 14.6, 25 females and 27 males); 54 youth in YA study (mean age 14.2, 31 females and 23 males)	CBPR to develop the intervention and prevention modules; feasibility study to develop measures	Intervention developed using CBPR; resulting prevention modules (ET=26 modules; YA=15 modules) were then implemented over a one year time period	The findings regarding adherence, quality, protective factors delivery, and reach, and the measurable effects observed together suggest this intervention warrants further testing in a prevention trial	Level 3: promising

First author, year, country	Objective	Sample size, setting	Design	Intervention / methods	Findings	Quality rating
Beckstead, 2015, US	Examine changes in patients in a substance use residential treatment center incorporating dialectical behaviour therapy with specific cultural, traditional and spiritual practices	229 American Indian / Alaskan Native youth (12-18); youth residential treatment setting	Pre- to post-treatment changes; no control group	Dialectical Behaviour Therapy (DBT), daily coaching on the use of DBT skills, spiritual counsellor assisted with activities (average length of stay 120 days)	96% of the youth either recovering or improving at the time of discharge. Authors were unable to detect the specific contribution of the incorporation of DBT with the traditional, spiritual and cultural practices	Level 3: promising
Donovan, 2015, US	Describe and evaluate the CBPR and Tribal Participatory Research (TPR) process involved in a university-tribal partnership that led to the development of Healing of the Canoe intervention to promote a sense of cultural belonging and to prevent substance abuse among tribal youth	Eight high school students (five males, three females) exposed to intervention through school curriculum; 23 youths (eight males, fifteen females) participated in intervention workshops	Baseline/post-evaluation design	CBPR and TPR approach used to design intervention that was a culturally grounded social skills intervention to promote increased cultural belonging and prevent substance abuse among tribal youth (adapted from existing school-based programs)	Participation in the intervention was associated with increased hope, optimism and self-efficacy, and with reduced substance use, as well as with higher levels of cultural identity and knowledge about alcohol and drugs among high school-aged tribal youth	Level 3: promising
Jainullabudeen, 2015, Australia	Evaluate the effects of a whole-of community, anti-binge drinking intervention for young people	18-24 year olds living in Yarrabah; 218 completed baseline survey; 154 completed post-intervention survey; community setting	Baseline/post-evaluation design was used; self-reported outcomes;	Intervention activities covered three broad themes: raising awareness of safe drinking practices, promotion of enjoyable alcohol-free activities as alternatives to alcohol inclusive events, and diversionary activities to alleviate boredom and motivate achievement and self-empowerment. Intervention was called "Beat da Binge"	Significant reduction in: short-term risky drinking and expenditure on alcohol, and activities with family/friends that include alcohol. Significant increases in: awareness of binge drinking, understanding of a standard drink, and those engaged in training as their main weekday activity	Level 3: promising

First author, year, country	Objective	Sample size, setting	Design	Intervention / methods	Findings	Quality rating
Vulnerable youth studies						
Hannam, 2009, Australia	Discussed the Youth Drug and Alcohol Court (YDAC) – a pilot program previously available in the Children's Court of NSW	Serious offenders with a demonstrable AOD problem, aged between 14-18; around 20 completed the program annually; delivered in community-based setting	Multifaceted design	The YDAC team consists of a nominated children's magistrate, prosecutor, legal aid and a representative from the Joint Assessment and Review Team ('JART'). The JART is made up of reps from participating NSW government departments and is responsible for developing individual program plans and reporting progress	Those who graduate gain significant benefits on many key indicators relating to reduced offending, such as reduced substance abuse, improved physical and mental health, access to counselling and psychological services, improved family relations and living skills, and access to stable accommodation. Many go on to find employment or return to school to complete their education	Level 3: promising
Indigenous studies						
Gray, 2014, Australia	To review the results of five research projects commissioned to enhance alcohol treatment among Aboriginal Australians	Treatment settings	Various	1. Training and tailored outreach support to improve alcohol screening and BIs in ACCHSs; 2. The Alcohol Awareness project: community education and BIs in an urban Aboriginal setting; 3. A culturally mediated case management model; 4. Non-residential treatment program offering pharmacotherapy, psychological and social support for Aboriginal clients with alcohol problems; 5. Aboriginal-mainstream partnerships	While the impact of the projects varied, they highlight the feasibility of adapting mainstream interventions in Aboriginal Australian contexts. Outcomes include greater potential to: screen for those at risk, increase community awareness, build capacity and partnerships between organisations and co-ordinate comprehensive referral networks and service provision'	Level 3: promising

First author, year, country	Objective	Sample size, setting	Design	Intervention / methods	Findings	Quality rating
Calabria, 2013, Australia	To describe the perceived acceptability of two cognitive-behavioural interventions, the Community Reinforcement Approach (CRA) and Community Reinforcement and Family Training (CRAFT)	Aboriginal participants >18, recruited through an ACCHS and new clients of a community-based D&A treatment agency in rural NSW	A self-completed survey	CRA uses social, familial and recreational positive reinforcement to modify the behaviour of problem drinkers. CRAFT is a family-focused version of CRA and teaches practical skills to family members of treatment-resistant problem drinkers	Both interventions were perceived as highly acceptable for delivery in their local Aboriginal community. CRA was deemed most acceptable for delivery to individuals after alcohol withdrawal and CRAFT for people who want to help a relative/friend start alcohol treatment	Level 3: promising
Maksimovic, 2015, Australia	To evaluate the Aboriginal-specific social marketing campaign, Give Up Smokes for Good	94 participants in Port Lincoln Aboriginal Health Service (regional) and 96 participants in Nunkuwarrin Yunti in Northern Metropolitan Adelaide (referred to as 'city')	Survey that assessed recall of anti-tobacco campaigns in general and specifically of the Give Up Smokes for Good campaign, as well as the cultural appropriateness of the campaign	The Give Up Smokes for Good pilot was developed and implemented in consultation with Aboriginal community members, tobacco social marketing experts, and key health agencies. Pilot messaging focused on: the benefits of smoke-free homes and cars, awareness of the harms associated with smoking and passive smoking, and making attempts to quit smoking	The Give Up Smokes for Good campaign reached the intended audience with high levels of campaign awareness. Results also suggest the pilot campaign made progress in achieving its communication objectives	Level 3: promising

Studies with emerging practice evidence (level 4)

Table 4 provides an overview of the seven studies that met the criteria for emerging practice evidence (level 4). For each study, the table provides information on the objective, method and key findings. In addition to the table, a brief summary is provided for each study according to whether it was focused on: Indigenous youth (six studies) or Indigenous populations (one study). Further discussion on the type and characteristics of effective interventions is provided below in response to review questions 1 and 2.

Indigenous youth studies

Mashquash et al.[37] outlines a four-stage method for developing early interventions for alcohol among First Nation youth in Canada. Stage 1 was an integrative approach to Indigenous education that upholds traditional wisdom. Stage 2 used quantitative methods to investigate associations between personality risk factors and risky drinking motives. Stage 3 used qualitative interviews to further understand the contexts and circumstances surrounding drinking behaviour within a larger cultural context. Stage 3 involved tailoring personality matched, motive-specific brief interventions to meet at-risk adolescents' needs. Stage 4 involved an efficacy test of the interventions – results of this stage are not mentioned in the current paper. The authors suggested that this novel methodology has significance for future program development to meet diverse social, cultural and health needs of at-risk adolescents.

Dell et al.[38] described the role of Indigenous culture in Canada and its intersection with Western approaches to recovery in the operation of Youth Solvent Addiction Program (YSAP's) residential treatment centers. YSAC has developed a treatment approach based on the elements of positive psychology, including resiliency theory and emotional intelligence, and grounded in an Indigenous cultural understanding.

Novins et al.[39] discussed a community based participatory research (CBPR) process to develop an intervention for Native American adolescents with substance use problems. The resulting intervention, Walking On, is an explicit blend of traditional Cherokee healing and spirituality with science-based practices such as CBT, cognitive behaviour therapy, and contingency management. Early pilot study results suggested that Walking On is feasible with further research required to examine its efficacy.

Raghupathy et al.[40] describes the process by which an existing evidence-based culturally relevant drug prevention intervention was transformed into a low-cost, computerised intervention digitised in order to extend its reach to Native American youth on reservations and in rural locations. The intervention, titled HAWK2 (Honoring Ancient Wisdom and Knowledge 2: Prevention and Cessation) used engaging multimedia features such as games, animations and video clips to impart substance abuse prevention knowledge and skills training. Authors noted that future studies of HAWK2 would provide an important means of testing the long-term effectiveness.

McCalman et al.[7] provided a theoretical model of the tailoring of health improvement initiatives by Indigenous Australian community-based service providers and partner university researchers using the Beat da Binge community-initiated youth binge drinking harm reduction project in Yarrabah – outlined in Jainullabudeen et al.[6] The authors noted that the theoretical model can be applied in spaces where local Indigenous and scientific knowledges meet to support the tailored design, implementation and evaluation of other health improvement projects, particularly those that originate from Indigenous communities.

McCalman et al.[41] outlined a study protocol of a multi-component mentoring intervention to increase levels of psychosocial resilience among Indigenous Australian secondary students. The authors will use an integrated mixed methods approach using an interrupted time series design. They noted that this is not stand-alone investigator-driven research, but rather an excellent example of researchers responding to the needs expressed by Indigenous Australian communities for effective programs to empower and promote wellbeing. The proposed study builds on extensive existing networks and research partnerships developed and supported over ten years.

Indigenous studies

Johnston et al.[42] explored the perceptions of remote Indigenous Australian community members and health staff regarding the acceptability and effectiveness of different tobacco control health promotion interventions. Qualitative methods were used for this exploratory study, including interviews with remote Indigenous community members and health staff, as well as observations of the delivery of different tobacco control activities in three remote communities in the Northern Territory. Results suggested that primary care interventions, such as brief advice and pharmaceutical quitting aids, when available and accessible, were perceived as important and effective strategies to help people quit, as were the promotion of smoke-free areas. By contrast unmodified Quit programs were perceived to have questionable application in this context and there were conflicting findings regarding taxation increases on tobacco and social marketing campaigns.

Table 4: Studies with emerging practice evidence (level 4)

First author, year, country	Objective	Sample size, setting	Design	Intervention / methods	Findings	Quality rating
Indigenous youth studies						
Mashquash, 2010, Canada	To develop a culturally relevant early intervention program for adolescent First Nation drinkers	Stage 2 – 164 adolescents from two Mi'kmaq communities (85 girls; 79 boys), ages 14–18; Stage 3 – eight at-risk adolescent drinkers (4 boys, 4 girls); Stage 4 – focus groups and refinement	Mixed methods	The intervention programming combined culturally tailored content and activities with CBT skills development. The four main components of our set of interventions were (a) culturally grounded content, (b) psycho-education, (c) behavioural coping skills training, and (d) cognitive coping skills training, all of which were delivered with culturally-tailored content and methods	This four-stage methodology is an important basic framework that can result in effective new interventions for First Nations youth by building community–researcher partnerships. NB: the efficacy of this set of interventions was tested in high schools in two rural First Nation communities in Nova Scotia – results presented elsewhere	Level 4: emerging
Dell, 2011, Canada	To illustrate the role of Indigenous culture and its intersection with Western approaches to recovery in the operation of Youth Solvent Addiction Program (YSAP's) residential treatment centers	112 residential treatment beds across nine centers for First Nations and Inuit youth ranging in age from 12-26	Descriptive piece	Programs vary by structure, gender, focus, duration (between four and six months), and are either continuous or block intake, meaning the cohort of youth enter either at random intervals or as one group beginning and ending at the same time	YSAP effectively employs resiliency and emotional intelligence theories in the context of Indigenous cultural knowledge and healing practices	Level 4: emerging
Novins, 2012, US	Community-based participatory research process to develop an intervention for Native American adolescents with substance use problems	Native American adolescents and their families; community based	CBPR approach	Walking On is divided into three phases of treatment: Finding the Winding Road (focusing on treatment engagement, rewarding abstinence from substances, and building basic relapse prevention skill); Staying on the Path (focusing on developing more independence in applying these skills); and Widening the Road (focusing on more advanced skills such as time management and mentoring others)	Currently pilot testing Walking On to refine the clinical manual and related administrative procedures. The results of these pilot tests will be the focus of subsequent reports	Level 4: emerging

First author, year, country	Objective	Sample size, setting	Design	Intervention / methods	Findings	Quality rating
Raghupathy, 2012, US	Describes the process by which an existing evidence-based, culturally relevant drug prevention intervention was transformed into a low-cost, computerised intervention digitised in order to extend its reach to NA youth in reservations and rural locations	NA children in elementary school settings (Grades 4 and 5)	CBPR approach	The intervention, titled HAWK2 (Honoring Ancient Wisdom and Knowledge2: Prevention and Cessation) uses engaging multimedia features such as games, animations, and video clips to impart substance abuse prevention knowledge and skills training	Initial feedback from practitioners and youth suggest the feasibility and acceptability of computer-based interventions	Level 4: emerging
McCalman, 2013, Australia	Provides a theoretical model of the tailoring of health improvement initiatives by Aboriginal community-based service providers and partner university researchers	Researchers initiated reflective quarterly CBPR meetings with the project steering committee and young Yarrabah people	CBPR approach	Beat da Binge was a two-year project – the whole-of-community social marketing approach incorporated prevention and awareness strategies to help overcome social and emotional wellbeing problems in the Yarrabah community	The tailored alcohol harm reduction project resulted in clarification of the underlying local determinants of binge drinking, and a shift in the project design from a social marketing awareness campaign (based on short-term events) to a more robust advocacy for youth mentoring into education, employment and training	Level 4: emerging
McCalman, 2016, Australia	Study aims to investigate the impact of a multicomponent mentoring intervention to increase levels of psychosocial resilience among Indigenous boarding school students	Transition support services (TSS) staff as mentors (24) and students as mentees (515). Students from Palm Island and Cape York communities attending boarding school	Mixed methods	TSS uses a case management approach based on a skilled helper mentoring model to support students from Palm Island and Cape York communities	Ongoing study	Level 4: emerging

First author, year, country	Objective	Sample size, setting	Design	Intervention / methods	Findings	Quality rating
Indigenous studies						
Johnston, 2010, Australia	To explore the perceptions of remote Indigenous community members and health staff regarding the acceptability and effectiveness of different tobacco control health promotion interventions	25 community members (age range 23-67); 15 current smokers; of the 19 health and welfare staff, five were Indigenous; three remote NT communities	Qualitative research methods	Semi-structured interviews and observation of the delivery of tobacco control interventions	Primary care interventions, such as brief advice and pharmaceutical quitting aids, when available and accessible, were perceived as important and effective strategies to help people quit, as were the promotion of Smokefree areas. By contrast unmodified Quit programs were perceived to have questionable application in this context and there were conflicting findings regarding taxation increases on tobacco and social marketing campaigns	Level 4: emerging

Grey literature search results

Grey literature search identified 232 references. Three extra studies were provided by the commissioning agency. In all, after removing duplicates, 156 references were screened for eligibility with 35 references kept for full-text assessment. Studies were excluded (n=21) if not pertinent to youth (n=8); not AOD specific (n=7); supply side interventions (n=3); school setting (n=1); or treatment interventions (n=2). Fourteen grey literature reports, including intervention evaluations (n=5) and reports containing critical factors for successful or best practice interventions in at risk youth (n=9) were included for the qualitative synthesis (Figure 3).

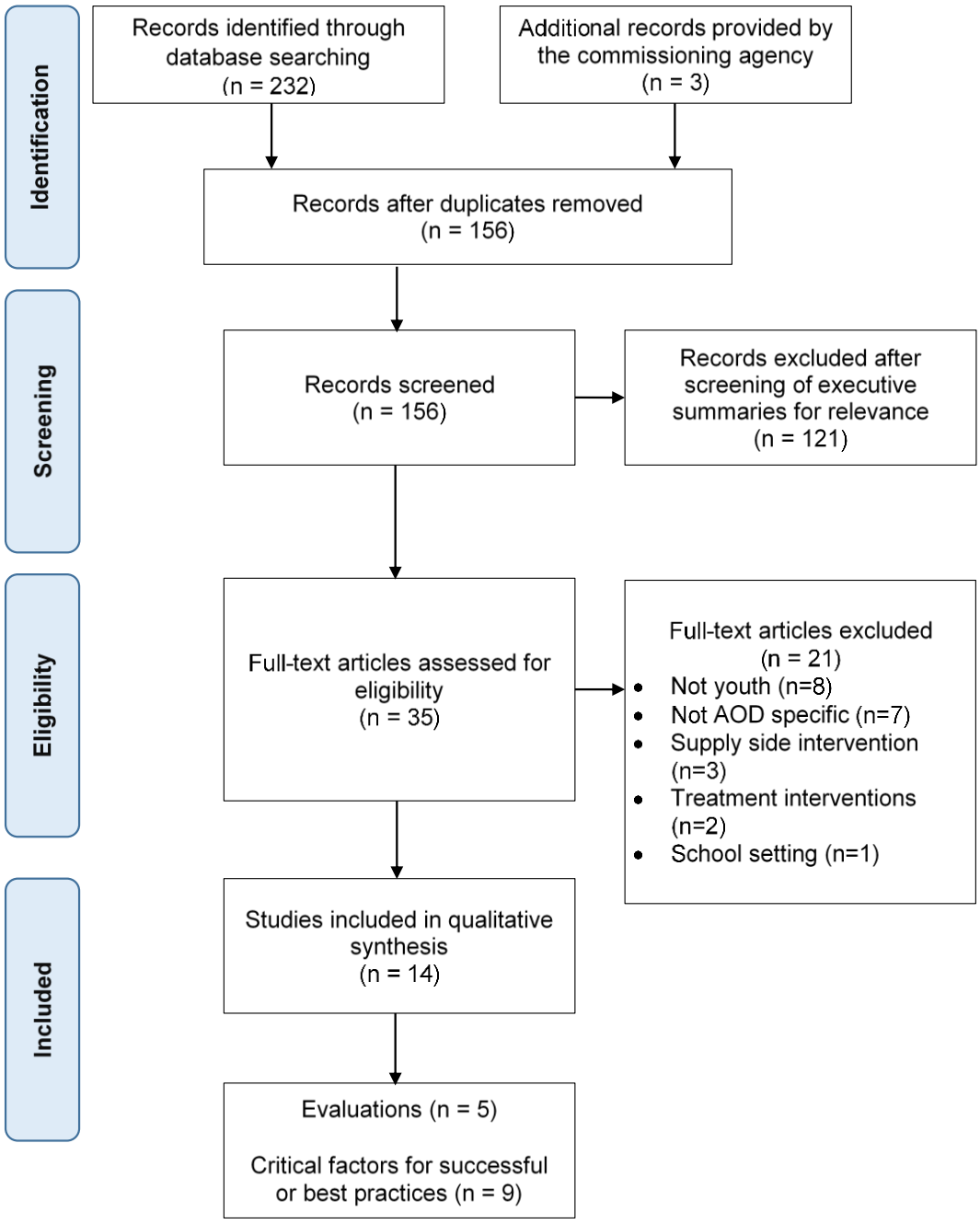


Figure 3: Grey literature search

Characteristics of grey literature interventions

Table 5 provides an overview of the five interventions targeting Indigenous young people at risk of AOD that are being implemented across Australian states and territories, in both remote and urban/regional centers. These included two community-based 'multi-service' programs[43,44] and three communication and education campaigns.[45, 46,47] Domains of the risk targeted by the interventions were substance use, sexual health, education, employment and resilience. Further discussion on the critical factors for success within this literature is provided in response to review question 2.

All five interventions provided level 4 or emerging practice evidence, which was obtained from case series, either post-test, or pre-test and post-test analyses. Major positive effects on promoting protective factors of AOD related harm included increased awareness of the harms associated with AOD or sexual health and where to get help[45,46,47], changes in trouble behaviour such as vandalism, fighting, drug use and other problematic activities[43,47], or secured employment.[44]

The Strong Spirit Strong Mind Metro Project education campaign aimed to increase awareness and knowledge of the harms associated with AOD use among young Indigenous Australians aged 12-25 years old, families and communities in the Perth metropolitan area.[46] Through a series of communication messages, the campaign encouraged Indigenous young people to develop skills, knowledge and attitudes to choose healthy lifestyles, promote healthy environments and create safer communities. The project was enhanced by a culturally secure AOD prevention campaign, which is used to communicate the key messages: "When our spirit is strong our mind is strong and we make good choices"; "Strong inner spirit keeps our family strong, our community strong and our culture alive"; and "Drugs and alcohol messes with your mind and affects your relationships". Results suggested that 83% of respondents indicated that they were more aware of the harms associated with AOD use as a result of the campaign, with 25% able to name each harm covered in the campaign, and 68% with awareness of where to get help.

The Take Blaktion campaign is another integrated communication and education campaign designed to improve the sexual health of young Indigenous Australians aged between 15-29 years old in NSW.[45] The core campaign components are: the use of high profile Indigenous comedians as ambassadors, comedy sketch videos shown on National Indigenous Television (NITV) over key Indigenous events, social media campaign via Facebook and Instagram, activations at six events (Koori Knockout, Ella 7s, Yabun, 3 x NAIDOC) and workshops at eight rural/regional locations across NSW. The key achievement of the workshops demonstrated a 58% increase in intentions to: carry condoms, use condoms, talk about STIs with partners and GPs and get tested for STIs. There was a 38% increase in sexual health knowledge including where to obtain further information about sexual health and knowledge.

The It's Your Choice, Have a Voice campaign aimed to empower and educate Indigenous Australian adolescents aged 12-19 years old to make informed choices about sexual and reproductive health and related AOD issues using an arts-based approach.[47] The campaign has been delivered in 14 communities across NSW. Impacts of the campaign include: increased confidence levels, increased familiarity and linkages between young people and health workers, increased contact with sexual health services, inspiration amongst some young people to pursue music/dance as a career, making healthy choices such as quitting smoking and yarndi (marijuana), and increased awareness of other services/agencies.

The Warlpiri Youth Development Aboriginal Corporation (WYDAC) is a community-based, 'multi-service' project that comprises such individual programs as diversionary, education and employment operating at five different Warlpiri sites: Yuendumu, Willowra, Nyirrpi, Lajamanu and Mt Theo Outstation.[44] The aim of the program is to support Warlpiri youth aged 16-22 years old in the creation of positive and meaningful futures as individuals, and for their communities. Programs include diversionary programs (cultural and other project activities) and development (training, education and employment support) designed to develop a sense of self, family, leadership

and culture. The programs have two levels: Level 1 engages young people (5-25 year olds) in a consistent program of positive, healthy and safe, cultural and project activities. These aim to increase enjoyment, interests and challenges, while correspondingly reducing negative behaviours such as substance misuse or other at-risk activity. Level 2 creates productive and formal life pathways for Warlpiri youth through opportunities from Jaru Trainee membership, training, education and employment. The retrospective cohort employment evaluation demonstrated that 92% of the participants who graduated from the Jaru program are currently employed.

Another Indigenous Australian community-based 'multi-service' project is the Central Australian Youth Link Up Service (CAYLUS).[43] CAYLUS programs include rehabilitation services, programs for young people, a responsible retail of solvents program, night patrols, policing initiatives, football carnivals and video and radio projects. The program aims to support community initiatives that improve quality of life, and address alcohol and other drug use issues affecting young people aged 12-25 years old. It targets both supply of harmful substances as well as reducing demand, with a particular focus on preventing volatile substance use. Results of the evaluation suggest that 95% of respondents felt that youth programs help keep young people from drinking alcohol and 98% of respondents indicating that youth programs help keep young people out of trouble including vandalism, fighting, drug use and other problematic activities.

Table 5: Summary of grey literature AOD intervention evaluations targeting at risk Aboriginal youth

Program, country	Intervention type: domain of risk	Objective	Key features	Type of study, quality rating	Sample size (% male if available)	Key findings
Strong Spirit Strong Mind Metro Project, Australia	Education campaign: substance use	Increase awareness and knowledge of 1) the harms associated with AOD use among young Aboriginal people, families and communities; and 2) available support services in the Perth metropolitan area	Project activities include the development of: • Culturally secure AOD resources and information; • AOD prevention campaign; • Youth Network Group; and • Targeted AOD strategies for Aboriginal young people	Single sample with post-test, Level 4	n=155* (12-25 years old) *The latest repeat of the campaign evaluation occurred in March and June 2016	83% of respondents were more aware of the harms associated with alcohol and other drug use as a result of the campaign, with around a quarter naming each harm covered in the campaign; and 68% percent where to get help
Take Blaktion Campaign, Australia	Education campaign: sexual health	1) Engage Aboriginal young people in NSW around sexual health; 2) Promote information about sexually transmissible infections (STIs); 3) Empower young people to make informed decisions around their sexual health and relationships, using comedy as a platform to reduce stigma and shame	The core campaign components: • The use of high profile Aboriginal comedians as ambassadors; • Comedy sketch videos shown on National Indigenous Television (NITV) over key Aboriginal events; • Social media campaign via Facebook and Instagram; • Activations at six events (Koori Knockout, Ella 7s, Yabun, 3 x NAIDOC); and • Workshops at eight rural/regional locations across NSW	Single sample with pre-test and post-test, Level 4	n=165 survey responses (42% male) (12-27 years old)	58% increase in intentions to: carry condoms, use condoms, talk about STIs with partners and GPs and get tested for STIs; 38% increase in sexual health knowledge including: STI transmission and prevention, where to obtain further information about sexual health and knowledge of the Play Safe website
It's Your Choice, Have a Voice Campaign, Australia	Education campaign: sexual and reproductive health, AOD related issues (unspecified)	Empower and educate Aboriginal adolescents from 14 communities in NSW to make informed choices about sexual and reproductive health and related AOD issues using an arts-based approach	Aspects of the campaign – hip hop dance, song-writing and salsa workshops	Two independent samples for pre-test and post-test, Level 4	n_{pre}=23 and n_{post}=26 (14-21 years old)	Qualitative findings incl.: increased confidence levels, young people opened up about their lives, increased familiarity and linkages between young people and health workers, increased contact with sexual health services and inspiration amongst some young people to pursue music/dance as a career

Program, country	Intervention type: domain of risk	Objective	Key features	Type of study, quality rating	Sample size (% male if available)	Key findings
Warlpiri Youth Development Corporation, Australia	Community-based; 'multi-service' projects: Diversionary, education and employment	Support Warlpiri youth (NT) in the creation of positive and meaningful futures as individuals and for their communities through diversionary, education, training and employment programs that develop a sense of self, family, leadership and culture	Programs include diversionary programs (cultural and other project activities) and development (training, education and employment support). The programs have two levels: Level 1 - engages young people (five to 25 year olds) in a consistent program of positive, healthy and safe cultural and project activities. Level 2 - creates productive and formal life pathways for Warlpiri youth through opportunities from Jaru Trainee membership, training, education and employment	Single sample with post-test, Level 4	Qualitative interviews with a range of stakeholders n=152 and retrospective cohort of participants n=74	92% of the participants from 2006 who graduated from the Jaru program are currently employed
Central Australian Youth Link Up Service (CAYLUS), Australia	Community-based; 'multi-service' projects: substance use violence, education, resilience	Support community initiatives that improve quality of life, and address alcohol and other drug use issues affecting young people in NT	CAYLUS programs include: rehabilitation services, programs for young people, a responsible retail of solvents program, night patrols, policing initiatives, football carnivals and video and radio projects	Single sample with post-test, Level 4	Not found	95% of respondents felt that youth programs help keep young people from drinking, 98% indicated that youth programs help keep young people out of trouble

Review question one: most effective interventions

Summary

The previous section provided a generic overview of each of the included studies. The purpose of this section is to consider the key attributes of the most successful (effective) interventions. From the 12 studies that met the criteria for best practice evidence, only a handful provided guidance on effective AOD interventions for Indigenous young people. A common theme underpinning these interventions is that success requires solutions developed within communities, strong community interest and engagement, leadership and sustainable funding.

The two reviews conducted by Calabria et al.[1,2] suggested that the most promising approaches to reduce alcohol-related harm in Indigenous youth include: community reinforcement, family training and coping skills training.

The review by Lee et al.[3] reported four effective programs aimed at young people with a recognised AOD problem with the common elements being engagement with community, inclusion of cultural activities and regular rather than one-off initiatives. These broader elements need to be combined with education on the risks of substance use, recreational activities or supply control measures.

Knight et al.[4] found the strongest community-based intervention to address multiple risk factors involved apprenticeship-focused training for juvenile offenders aged 15-18 years. Other effective/promising strategies included: web-based alcohol screening and brief intervention, the use of incentives to encourage behaviour change[19], and social media campaigns.[36]

An interesting community-driven approach was outlined by Mohatt et al.[5] that relied on a 'toolbox' approach – a compendium of cultural activities that serve as a starting point in the development of interventions contextualised to the customs and history of each local community, built around protective factors. The authors suggested that standardising interventions by the functions an intervention serves (protective factors promoted) instead of their forms or components (specific activities) can assist in refining CBPR interventions and evaluating effects in culturally distinct settings.

Another study of note is the Indigenous community-driven response to binge drinking in Yarrabah. The Beat da Binge project resulted in a National Drug and Alcohol Award for excellence in services for young people. McCalman et al.[7] suggest that this community-led, researcher-integrated approach might provide a more effective blueprint for reducing alcohol-related harm than the traditional government- or researcher-designed policies and programs that typically allow insufficient community input.

The grey literature identified a further five interventions targeting Indigenous young people at risk of AOD. These included two community-based multi-service programs and three communication/education campaigns. Two of these campaigns were NSW based – the Take Blaktion Campaign and the It's Your Choice, Have a Voice Campaign. Both strategies are integrated communication and education campaigns designed to empower and educate Indigenous adolescents. [45,47]

Studies with best practice evidence (level 1 and 2)

Evidence from reviews

The focus of the Jiwa et al.[18] review was on understanding the development of culturally based and community-based alcohol and substance abuse treatment programs for Indigenous patients. The authors suggested that the literature on Indigenous community-based treatment programs emphasises the importance of viewing addiction through a sociocultural lens and enhancing community empowerment in the development of programs. The authors noted, however, that there is a paucity of evaluation and outcome data for these programs.

The Calabria et al.[1] review of interventions (delivered outside educational settings) for young people with existing alcohol use problems identified nine studies of various methodological quality. The authors noted that the most promising approaches to reduce alcohol-related harm are CBT, family therapy and community reinforcement. It is important to note that none of these studies were specific to Indigenous youth and eight of the nine studies were conducted in the US.

In a review of family-based interventions targeting alcohol misuse in Indigenous communities, Calabria et al.[2] identified 19 counselling-based strategies: 11 involved inclusion of a family member and eight targeted family members of problem drinkers. The authors noted that the most effective programs identified by the review are community reinforcement and family training, coping skills training and 12-step facilitation. Calabria et al.[35] subsequently tested the acceptability of two Indigenous-specific family-based cognitive-behavioural interventions, CRA and CRAFT.

The review by Lee et al.[3] reported four projects that were effective in reducing substance use: three were universal programs aimed at a broad population of young people and one was a targeted program aimed at young people with a recognised AOD problem. Only one of these studies, Lee et al.[21], was within the time frame for the rapid review – this study is discussed below. The four effective programs identified by Lee et al.[3] shared several common elements: two incorporated cultural activities, all offered regular rather than one-off initiatives and all involved more than one component. Each was developed with communities to protect young people (and sometimes the whole community) against substance misuse. These broader elements were combined with other elements, such as education on the risks of substance use, recreational activities or supply control.

The review of interventions that target multiple risk factors in high-risk young people, conducted by Knight et al.[4], found 13 studies that targeted multiple risk factors. Six of these were school-based, two in treatment centres and five community based. Only one of the five community-based interventions achieved a methodological quality rating higher than weak. The strongest community-based intervention involved apprenticeship-focused training for juvenile offenders aged 15-18 years and resulted in statistically significantly improved rates of self-reported employment and educational outcomes.

Evidence from specific studies (excluding school-based)

The web-based alcohol screening and brief intervention conducted by Kypri et al.[13] found positive outcomes in terms of lower levels of drinking and improvements in academic performance. This low-cost study involved personalised feedback on participants drinking with an explanation of the associated health risk and information about how to reduce that risk.

Glover et al.[19] used an RCT design to investigate incentives ($25 for each week abstinent from smoking) for pregnant Maori smokers. Although the sample size was low which restricted generalisability, the authors noted that incentives may be an effective addition to usual care to increase smoking cessation among pregnant women.

Studies with promising practice evidence (level 3) (excluding school-based)

Lee et al.[21] evaluated the acceptability and perceived effectiveness of the youth development unit, a community initiative in remote communities in NT that offers programs to all young people and provides case management for juvenile diversion. In the unit's formative stages, community representatives described their vision for wide-ranging preventive youth activities developed in close consultation with communities that strengthened local authority and culture, improved integration between the two cultures and provided alternatives to substance misuse and criminal activity. Skill development that capitalised on both Indigenous and Western cultures was a priority. Although a promising initiative, the authors suggested that further research is needed to assess the longer-term impact in reducing substance misuse and mental health disorders.

In the NT, a diversion scheme for youth who committed offences was developed as part of a multiple-component, preventive youth initiative with NT and Commonwealth government support.[22] The initiative is referred to as the NT Juvenile Diversion Unit (JDU). In this scheme, young people were diverted from criminal justice and referred to a community-based diversion initiative that involved: counselling and referrals to local Indigenous mental health worker program, community work and activities, training and education, and retribution. Clough et al.[22] noted that a high completion rate was achieved despite a lack of obstacles mostly involving logistics of providing appropriate support to participants.

In the only other diversionary program identified by this rapid review, Hannam[33] discussed the merits of the youth drug and alcohol court (YDAC). The YDAC team involved a magistrate, prosecutor, legal aid and representatives from participating government departments. YDAC offered a range of therapeutic interventions to young people who are involved in the criminal justice system in NSW. Although not formally evaluated, and now defunded, the program was considered to have an important positive impact on the lives of many of those participating.

Henry et al.[27] conducted a research study to develop a method for quantifying intervention exposure in CBPR interventions that differ in their forms across communities to facilitate multi-site evaluation. This project was extended by Mohatt et al.[5] The basis of the study is the Qungasvik, a Yup'ik word meaning toolbox. The Qungasvik is a compendium of cultural activities that serve as a starting point in the development of interventions contextualised to the customs and history of each local community, built around protective factors. Protective characteristics were explored at three levels: community (safe places, opportunities, role models, limits on alcohol use), family (affection/praise, being treated as special, clear limits and expectations, family models of sobriety) and individual (self-efficacy, communal mastery, wanting to be a role model). The resulting Qungasvik intervention toolbox was organised into 36 modules, and each module addresses two to five protective factors.

Feasibility of implementation of this intervention was evaluated through an assessment of adherence, quality, protective factors, delivery and reach using observational data from five randomly selected intervention modules. Across these five modules, individual characteristics (66%) were implemented more often than family (16%) or community (18%) characteristics. The authors suggested that standardising interventions by the functions an intervention serves (protective factors promoted) instead of their forms or components (specific activities) can assist in refining CBPR interventions and evaluating effects in culturally distinct settings.

The Beat da Binge intervention outlined by McCalman et al.[7] and Jainullabudeen et al.[6] is a whole-of community, anti-binge drinking intervention for Indigenous Australian young people (18-24 year olds) in Yarrabah, an Indigenous community in Far North Queensland. The strategy was community-driven and actively engaged young people in its design, implementation and evaluation. Researchers initiated reflective quarterly CBPR meetings with the project steering committee and young Yarrabah people. Beat da Binge

was a low-cost strategy that resulted in significant reductions in short-term risky drinking and expenditure on alcohol, and significant increases in awareness of binge drinking and understanding of a standard drink.

Maksimovic et al.[36] evaluated the pilot phase of South Australia's first ever Aboriginal-focused anti-tobacco social marketing campaign. Give Up Smokes for Good was aimed to educate Indigenous people about the harms associated with tobacco smoking and to encourage smoking-related behaviour change. The results were encouraging but not generalisable.

Studies with emerging practice evidence (level 4)

The HAWK2 program outlined by Raghupathy et al.[40] is a computer-based drug prevention intervention. The strategy is an evidence-based, culturally relevant drug prevention intervention transformed into a low-cost, computerised intervention that was digitised in order to extend its reach to Native American youth in reservations and rural locations. Although not evaluated, initial feedback from practitioners and youth suggest the feasibility and acceptability of computer-based interventions.

McCalman et al.[41] introduced a novel approach to building resilience through a mentoring approach. The aim of the ongoing study is to modify suicide risk for remote Indigenous Australian students at boarding school. The authors noted that this is not stand-alone investigator-driven research, but rather an excellent example of researchers responding to the needs expressed by Indigenous Australian communities for effective programs to empower and promote wellbeing.

Evidence from the grey literature

Little research has been conducted into the effects of recreational programs including sporting activities involving Indigenous Australian young people.[48] Evidence of the impact of cultural programs is even more limited.[49] Sports and cultural programs appear to have the capacity to engage young Indigenous people.[48] These programs may be associated with improved school attendance, decreased substance misuse and decreased youth crime. If the impacts of sporting programs are sustained, then this should improve the health and educational attainment for Indigenous youth.

Evidence from the US reported improved drug refusal skills as a result of youth share cultural enrichment exercises and wellness education.[48] A focus of the program was to provide HIV/AIDS and substance misuse prevention programs targeted at young people aged 9-22. One component of the program is the annual Gathering of Native Americans where Native American youth share cultural enrichment exercises and wellness education. It is based on a holistic model that aims to incorporate Native American wellness concepts, and 55% reported improved drug refusal skills.

In Australia, there is some evidence to suggest that recreational programs are most effective with young people among whom AOD use has not become entrenched.[50] There are programs that are mentioned in the grey literature and it would be useful if these were formally evaluated to increase the understanding of the benefits of sporting programs.

As with general AOD education for young people, scare tactics are not effective, and information based on the immediate needs and proprieties of users has been shown to be the most influential.[51] With regards to what constitutes salient information, for example, interviews with current and reformed young Indigenous petrol sniffers suggested that neurological effects, such as impaired coordination from using volatile substances, worried them, particularly when such impairment might interfere with their ability to play sport.[51] Other suggestions on how to improve a communication and education campaign message reach included: making posters more attention grabbing through improved visuals, increasing the logo size on all material, ensuring people depicted are clearly Indigenous, and increasing brand recognition through more promotion.[46]

Education targeting parents and other forms of parental support can be useful, particularly as those who experimented with substance misuse in their youth might not understand the consequences of more

intensive or longer-term use.[51] Programs for Indigenous parents have not been evaluated in Australia, but education campaigns in Native American communities have been linked with decreasing levels of substance misuse.[51]

Diversionary options such as drug courts and cautioning programs are assessed as successful or unsuccessful based largely on their impact on reoffending rates. The research is not positive in relation to Indigenous recidivism rates.[52] Although research indicates some decline, recidivism among Indigenous participants generally remains higher than that of non-Indigenous offenders. Despite this, the Indigenous Sentinel Study reported that there are positive impacts in reducing drug use and offending among Indigenous Australian participants of select IDDI programs, although this was based on the very limited information available.[52] Diversionary activities run by Warlpiri Youth Development Corporation were also seen by local stakeholders as an effective way of reducing crime, reducing levels of volatile substance use, and reducing levels of drinking among young people.[43]

Review question two: critical factors

Summary

For the effective interventions outlined above and discussed in more detail below, there appears to be four key factors for successful implementation and sustainability: strong community interest, engagement, leadership and sustainable funding. Engagement is fundamental. An effective intervention is likely to have local community support that takes advantage of partnership and engages with the community in all facets of an intervention – from conceptualisation to planning, implementation, evaluation and dissemination. Engagement is reinforced through paid positions of community elders or experts to deliver programs and organising. Effective interventions incorporate cultural values and activities and have a strength-based focus (as opposed to using a deficit base). They are multifaceted and flexible, and address both individual and community issues. They also use a multi-pronged approach that combines a range of activities including educational, case management and work-skills development. Further, an intervention needs to be flexible enough to meet the needs of individual clients and adopt various delivery modes (through, for example, mentoring approaches, motivational interviewing or CBT techniques). Effective interventions are offered as regular rather than one-off initiatives. Sustainability is facilitated through the ability to develop infrastructure and/or systems and the ability to attract additional funding.

Studies with best practice evidence (level 1 and 2)

Evidence from reviews

Jiwa et al.[18] noted that each Indigenous community is unique, and patterns and prevalence of drug and alcohol use differ widely. The complexity of the problem identified requires individual and flexible plans specific to the communities' needs and objectives. While promoting community involvement and participatory processes in these programs, there is also a need for well-designed studies and increased research in the field so that communities can draw on one another's successes as they engage in community development and addictions treatment. The key components of success are strong leadership, strong community-member engagement, paid positions for program co-ordination and organising, and the ability to develop infrastructure for long-term program sustainability.

Calabria et al.[2] noted that given the central role that family relationships play in reinforcing behaviour and maintaining social cohesion in Indigenous communities, family-based approaches offer considerable promise for reducing alcohol-related harms among Indigenous peoples. Family-based interventions are more likely to be acceptable, appropriate, and effective for Indigenous peoples if: they are adapted with the input of Indigenous community members, involve all family members, are delivered by a trained professional to optimise intervention fidelity, and the intervention has sufficient flexibility to meet the needs of individual clients.

Lee et al.[3] suggested that effective programs are developed with communities, incorporate cultural activities, are offered as regular rather than one-off initiatives, involved more than one component, and are often combined with other elements such as education on the risks of substance use, recreational activities or supply control.

Knight et al.[4] identified four common elements across successful programs: they are multi-component (i.e. deliver more than one strategy), they use motivational interviewing techniques, they use CBT techniques and they have work-skills development and case management activities.

Evidence from specific studies (excluding school-based)

Kypri's et al.[13] web-based alcohol screening and brief intervention was developed iteratively over a ten-year period involving consultation with Maori and non-Maori university students, Maori student support services and with the aid of Maori co-investigators and research staff. This consultation and research yielded an instrument that was appealing to Maori and non-Maori university students such that content was not specific to either group. Notably, on the basis of advice from Maori co-investigators, Maori-specific normative feedback was eschewed to avoid framing Maori student drinking in terms of a deficit model.

Studies with promising practice evidence (level 3) (excluding school-based)

Lee et al.[21] found that a collaborative community-driven approach had the potential to increase connectedness in addressing youth problem behaviours in Indigenous communities. Appealing programs that combine youth training and employment preparedness with recreation and culture, and are accepted by communities, provide alternatives to substance misuse and have the potential to enhance youth resilience

Henry et al.[27] and Mohatt et al.[5] both relied on a CBPR approach that engaged communities in every aspect of the research process, including planning, measurement development, implementation, analysis and interpretation. As noted earlier, both studies relied on a Qungasvik, a Yup'ik word meaning toolbox. Instead of being a prescriptive manual dictating precise components for each intervention activity, the Qungasvik is a compendium of cultural activities that serve as a starting point in the development of interventions contextualised to the customs and history of each local community and built around the same protective factors.

In Yarrabah, the process of tailoring a community response to binge drinking led Gindaja to win a National Drug and Alcohol Award for excellence in services for young people in June 2013.[6,7] More broadly, the theoretical model of tailoring a community-owned response by negotiating knowledges and meanings provides a framework for systematically strengthening the evidence base for how research partnerships can tailor effective health improvement approaches by integrating local Indigenous knowledge and assessments with the scientific evidence. McCalman et al.[7] suggested that this integrated approach may provide a more effective blueprint for reducing alcohol-related harm than the traditional government- or researcher-designed policies and programs that typically allow insufficient community input.

The 'Give Up Smokes for Good social marketing campaign evaluated by Maksimovic et al.[36] was developed and implemented in consultation with Indigenous community members, tobacco social marketing experts and key health agencies; and guided by existing literature.

Evidence from the grey literature

Consistent with the peer-reviewed evidence above, the grey literature identified a number of common factors for successful implementation and sustainability of interventions targeting Indigenous young people at risk of AOD. These factors include:

- Local community support and partnership in planning and implementation
- Strong community engagement using newsletters and posters
- Induction processes and consistent support to staff including capacity building
- Program strategies that address both individual and community issues
- Effective data collecting, assessment and feedback to individuals
- Long-term partnerships between the community and program staff
- Sustainable source funding.

A series of reviews over the years synthesised evidence around key success elements of volatile substance use community-based interventions.[50,51,53] It was found that: programs need enthusiastic support from non-Indigenous agencies, such as the council, school, and police; broad community and family support is needed, along with active involvement in roles such as becoming wardens by taking children to outstations and teaching them about their culture; and several strategies should be implemented as part of any one campaign.[51]

Midford et al.[50] argued that youth work in remote Australian Indigenous communities is challenging and requires diverse skills, such as operating 4WD vehicles, hunting, painting, crisis support, sporting activities and applying for grants. Elements of successful recreation and youth programs are: measures to avoid stigmatising drug users, a focus on skill and capacity development, offering a range of activities including opportunities for risk-taking, activities that are offered on a flexible basis, utilising local resources and activities that are sustainable.

Strategies that are consultative, empowering, public-spirited and community-based are more likely to be effective because they are tailored to the community and are community-driven and owned. Further, the sense of ownership and empowerment ensures that community members are actively engaged and involved in the response process, rather than passively on the receiving end of directive policy.[51]

Discussion

Gap analysis

As Knight et al.[4] noted, more methodologically rigorous evaluations of interventions targeting multiple risk factors among high-risk young people are required, especially for those delivered in community settings. Four key areas for improvement are: more precisely defining the risk factors experienced by high-risk young people, achieving greater consistency across interventions, standardising outcome measures and conducting economic analyses.

All of the systematic reviews highlight the lack of methodological rigour in study design, implementation and evaluation. Best practice evidence, traditionally through RCTs, are expensive and may not be conducive to Indigenous settings. Mohatt et al.[5] noted that due to local concerns expressed regarding the potential impracticality and cultural inappropriateness of RCT designs, further studies could make use of one of the promising quasi-experimental alternatives to RCTs, such as dynamic wait-listed designs.

This review discussed several diversion schemes including the NT Juvenile Diversion Unit and the de-funded youth drug and alcohol court (YDAC).[22,33] Diversionary options such as drug courts and cautioning programs are assessed as successful or unsuccessful based largely on their impact on recidivism rates. Although research indicated some decline, recidivism among Indigenous participants generally remains higher than that of non-Indigenous offenders. Diversionary activities run by Warlpiri Youth Development Corporation were also seen by local stakeholders as an effective way of reducing crime, levels of volatile substance use, and levels of drinking among young people.[43] They were also seen as an effective way of equipping young people with the skills they need to do well at school. Further research is warranted.

The review found limited research on recreational programs such as sporting activities or cultural activities. Sports and cultural programs appear to have the capacity to engage young Indigenous Australian people.[48] These programs might be associated with improved school attendance, decreased substance misuse and decreased youth crime. If the impacts of sporting programs are sustained they should improve the health and educational attainment of Indigenous Australian youth. Further, education targeting parents and other forms of parental support can be useful.[51] However, programs for Indigenous parents have not been evaluated in Australia, but education campaigns in Native American communities have been linked with decreasing levels of substance misuse.[51]

Analysis of the applicability for NSW

Results of this rapid review are applicable to the situation in NSW. Many of the peer-reviewed papers were Australian and the grey literature identified several NSW strategies.

Conclusion/Recommendations

The authors of this rapid review recommend that the NSW Drug and Alcohol Population and Community Programs apply three principles, activated with four sequential steps, in order to align its planned activities with current best evidence practice and optimise its investment in programs for young people. The three principles are:

1. *Be clear about the types of programs that are of most interest.* In general, school- and web-based programs will access a relatively large number of young people, but they are unlikely to be effective for youth who are already at increased risk of AOD related harm. The implementation of a range of programs targeting different populations of young people is obviously desirable (and, as shown in this review, a range of different programs were identified in the literature), but where limited funding is available it will be most effective if it focuses on programs that target a defined population.
2. *Ensure there is existing and strong community support for programs*. This principle reflects the most common theme that underpinned each of the programs identified and examined in this review: that successful programs are those that have strong community interest, engagement, leadership and sustainable funding. Again, given limited resources, supporting programs with existing community support and operational budgets will be both a more efficient and sustainable use of funds.
3. *Support more rigorous evaluation of programs*. This review identified only one community-based level 1 or 2 (best practice) evaluation. At present, studies are either strong on evaluation or strong on community engagement, but not both. A more rigorous evaluation would address the current limitations identified by the gap analysis in this rapid review: i) develop an evidence-based assessment process that could be used routinely by service providers to both define the risk factors of high-risk young people more precisely and standardise outcome measures; ii) achieve greater consistency across programs; and iii) undertake process, outcome and economic analyses (consistent with the NSW Government Program Evaluation Guidelines).

The authors also recommend that these three principles be activated with four sequential steps:

1. *Determine the specific focus of its investment.* Specifically, whether the preference is to support school-based or web-based primary prevention programs, or community-based, targeted programs for Aboriginal young people at high risk of AOD harm.
2. *Identify researchers or other evaluators with relevant and demonstrated expertise in conducting rigorous process, outcome and economic evaluations in real-world settings with service providers*. This could be a transparent and rigorous Expression Of Interest (EOI) process.
3. *Identify existing community-based programs relevant to the specific focus of the investment (i.e.: school-based programs or community-based programs for high-risk young people)*. The authors of this rapid review are aware of a number of existing such programs and relevant organisations in metropolitan, rural and remote communities in NSW (e.g. BackTrack [Armidale], Ted Noffs [Sydney], Maranguka [Bourke, Condobolin], so these programs exist and would be readily identifiable. This could be a task for the evaluation team selected through the EOI process.
4. *Support a partnership between the evaluation team selected through the EOI process and the participating community-based programs.* The purposes of the partnership would be: i) address the current gaps in knowledge identified in the gap analysis; ii) create a sustainable network of services and researchers that can be increased over time; iii) leverage an initial investment through other funding sources, such as ARC Linkage grants, NHMRC Partnership grants and private sector funding.

References

1. Calabria B, Shakeshaft AP, Havard A. A systematic and methodological review of interventions for young people experiencing alcohol-related harm. Addiction. 2011;106(8):1406-18.
2. Calabria B, Clifford A, Shakeshaft AP, Doran CM. A systematic review of family-based interventions targeting alcohol misuse and their potential to reduce alcohol-related harm in Indigenous communities. Journal of Studies on Alcohol and Drugs. 2012;73:477-88.
3. Lee KK, Jagtenberg M, Ellis CM, Conigrave KM. Pressing need for more evidence to guide efforts to address substance use among young Indigenous Australians. Health Promotion Journal of Australia. 2013;24(2):87-97.
4. Knight A, Shakeshaft AP, Havard A, Maple M, Foley C, et al. The quality and effectiveness of interventions that target multiple risk factors among young people:a systematic review. Aust NZ J Public Health. 2017;41(1):54-60.
5. Mohatt GV, Fok CC, Henry D, People Awakening Team, Allen J. Feasibility of a community intervention for the prevention of suicide and alcohol abuse with Yup'ik Alaska Native youth: the Elluam Tungiinun and Yupiucimta Asvairtuumallerkaa studies. Am J Community Psychol. 2014;54(1-2):153-69.
6. Jainullabudeen TA, Lively A, Singleton M, Shakeshaft AP, Tsey K, et al. The impact of a community-based risky drinking intervention (Beat da Binge) on Indigenous young people. BMC Public Health. 2015;15:1319.
7. McCalman J, Tsey K, Bainbridge R, Shakeshaft A, Singleton M, et al. Tailoring a response to youth binge drinking in an Aboriginal Australian community: a grounded theory study. BMC Public Health. 2013;13(726)
8. Australian Institute of Health and Welfare. Youth justice in Australia. Bulletin 133. Canberra: Australian Government; 2016.
9. MacRae A, Hoareau J. Review of illicit drug use among Aboriginal and Torres Strait Islander people. . Australian Indigenous HealthInfoNet. Retrieved [25 January 2017] from http://www.aodknowledgecentre.net.au/aodkc/illicit-drug-use/reviews/illicit-drug-use-review: 2016.
10. Canadian Homelessness Research Network. What Works and For Whom? A Hierarchy of Evidence for Promises Practices Research. Toronto: Canadian Homelessness Research Network Press; 2013.
11. Carson KV, Brinn MP, Labiszewski NA, Peters M, Chang AB, et al. Interventions for tobacco use prevention in Indigenous youth. The Cochrane database of systematic reviews. 2012(8):Cd009325.
12. Johnson KW, Shamblen SR, Ogilvie KA, Collins D, Saylor B. Preventing youths' use of inhalants and other harmful legal products in frontier Alaskan communities: a randomized trial. Prev Sci. 2009;10(4):298-312.
13. Kypri K, McCambridge J, Vater T, Bowe SJ, Saunders JB, et al. Web-based alcohol intervention for Māori university students: double-blind, multi-site randomized controlled trial. Addiction. 2013;108(2):331-38.
14. McKennitt DW, Currie CL. Does a culturally sensitive smoking prevention program reduce smoking intentions among Aboriginal children? A pilot study. Am Indian Alsk Native Ment Health Res. 2012;19(2):55-63.
15. Okamoto SK, Kulis S, Helm S, Lauricella M, Valdez JK. An Evaluation of the Ho'ouna Pono Curriculum: A Pilot Study of Culturally Grounded Substance Abuse Prevention for Rural Hawaiian Youth. Journal of Health Care for the Poor and Underserved. 2016;27(2):815-33.
16. Kulis SS, Ayers SL, Harthun ML. Substance Use Prevention for Urban American Indian Youth: A Efficacy Trial of the Culturally Adapted Living in 2 Worlds Program. J Primary Prevent. 2017;38:137-58.
17. Schaeffer CM, Henggeler SW, Ford JD, Mann M, Chang R, et al. Randomised controlled trial of a promising vocational/employment program for high-risk juvenile offenders. J Subst Abuse Treat. 2014;46(2):134-43.
18. Jiwa A, Kelly L, St. Pierre-Hansen N. Healing the community to heal the individual: Literature review of aboriginal community-based alcohol and substance abuse programs. Can Fam Phys. 2008;54(7):1000-00.e7.
19. Glover M, Kira A, Walker N, Bauld L. Using incentives to encourage smoking abstinence among pregnant indigenous women? A feasibility study. Matern Child Health J. 2015;19(6):1393-9.
20. Mashquash CJ, Comeau MN, Stewart SH. An Alcohol Abuse Early Intervention Approach with Mi'kmaq Adolescents. First Peoples Child & Family Review. 2007;3(1):17-26.
21. Lee KS, Conigrave KM, Clough AR, Wallace C, Silins E, et al. Evaluation of a community-driven preventive youth initiative in Arnhem Land, Northern Territory, Australia. Drug Alcohol Rev. 2008;27(1):75-82.
22. Clough AR, Kim San Lee K, Conigrave KM. Promising performance of a juvenile justice diversion programme in remote Aboriginal communities, Northern Territory, Australia. Drug Alcohol Rev. 2008;27(4):433-38.
23. Charlier N, Glover M, Robertson J. Keeping Kids Smokefree: lessons learned on community participation. Health Educ Res. 2009;24(6):949-56.

24. McGrath BB, Ka'ili TO. Creating Project Talanoa: a culturally based community health program for U.S. Pacific Islander adolescents. Public Health Nurs. 2010;27(1):17-24.
25. Gilder DA, Luna JA, Calac D, Moore RS, Monti PM, et al. Acceptability of the use of motivational interviewing to reduce underage drinking in a Native American community. Subst Use Misuse. 2011;46(6):836-42.
26. Nelson K, Tom N. Evaluation of a substance abuse, HIV and hepatitis prevention initiative for urban native Americans: The native voices program. Journal of Psychoactive Drugs. 2011;43(4):349-54.
27. Henry D, Allen J, Fok CC, Rasmus S, Charles B. Patterns of protective factors in an intervention for the prevention of suicide and alcohol abuse with Yup'ik Alaska Native youth. (Special issue on advancing American Indian and Alaska native substance abuse research: current science and future directions.). American Journal of Drug & Alcohol Abuse. 2012;38(5):476-82.
28. Moore RS, Roberts J, McGaffigan R, Calac D, Grube JW, et al. Implementing a reward and reminder underage drinking prevention program in convenience stores near Southern California American Indian reservations. American Journal of Drug & Alcohol Abuse. 2012;38(5):456-60.
29. Kulis S, Dustman PA, Brown EF, Martinez M. Expanding urban American Indian youths' repertoire of drug resistance skills: pilot results from a culturally adapted prevention program. Am Indian Alsk Native Ment Health Res. 2013;20(1):35-54.
30. Helm S, Okamoto SK. Developing the Ho'ouna Pono substance use prevention curriculum: collaborating with Hawaiian youth and communities. Hawaii J Med Public Health. 2013;72(2):66-9.
31. Beckstead DJ, Lambert MJ, DuBose AP, Linehan M. Dialectical behavior therapy with American Indian/Alaska Native adolescents diagnosed with substance use disorders: combining an evidence based treatment with cultural, traditional, and spiritual beliefs. Addict Behav. 2015;51:84-7.
32. Donovan DM, Thomas LR, Sigo RL, Price L, Lonczak H, et al. Healing of the canoe: preliminary results of a culturally tailored intervention to prevent substance abuse and promote tribal identity for Native youth in two Pacific Northwest tribes. Am Indian Alsk Native Ment Health Res. 2015;22(1):42-76.
33. Hannam H. The Youth Drug and Alcohol Court: An Alternative to Custody. Indigenous Law Bulletin. 2009;7(13):12-15.
34. Gray D, Wilson M, Allsop S, Saggers S, Wilkes E, et al. Barriers and enablers to the provision of alcohol treatment among Aboriginal Australians: A thematic review of five research projects. Drug Alcohol Rev. 2014;33(5):482-90.
35. Calabria B, Clifford A, Shakeshaft A, Allan J, Bliss D, et al. The acceptability to Aboriginal Australians of a family-based intervention to reduce alcohol-related harms. Drug Alcohol Rev. 2013;32(3):328-32.
36. Maksimovic L, Shen D, Bandick M, Ettridge K, Eckert M. Evaluation of the pilot phase of the 'Give up smokes for good' social marketing campaign. Health Promotion Journal of Australia. 2015;26(1):16-23.
37. Mashquash CJ, Comeau MN, McLeod BD, Stewart SH. A Four-Stage Method for Developing Early Interventions for Alcohol Among Aboriginal Adolescents. Int J Ment Health Addiction. 2010;8:296-309.
38. Dell D, Hopkins C. Residential volatile substance misuse treatment for indigenous youth in Canada. Substance use & misuse. 2011;46 Suppl 1:107-13.
39. Novins DK, Boyd ML, Brotherton DT, Fickenscher A, Moore L, et al. Walking on: celebrating the journeys of Native American adolescents with substance use problems on the winding road to healing. Journal of Psychoactive Drugs. 2012;44(2):153-9.
40. Raghupathy S, Forth AL. The HAWK2 program: a computer-based drug prevention intervention for Native American youth. American Journal of Drug & Alcohol Abuse. 2012;38(5):461-7.
41. McCalman J, Bainbridge R, Russo S, Rutherford K, Tsey K, et al. Psycho-social resilience, vulnerability and suicide prevention: impact evaluation of a mentoring approach to modify suicide risk for remote Indigenous Australian students at boarding school BMC Public Health. 2016;16(98)
42. Johnston V, Thomas DP. What works in Indigenous tobacco control? the perceptions of remote Indigenous community members and health staff. Health Promotion Journal of Australia. 2010;21(1):45-50.
43. National Drug and Alcohol Research Centre. Evaluation of the CAYLUS youth worker brokerage program: executive summary. Sydney, NSW: NDARC; 2016.
44. Shaw G. An evaluation of the Warlpiri Youth Development Aboriginal Corporation Youth Development Program, incorporating the WETT (Warlpiri Education Training Trust) Youth Development Program. Canberra, ACT: Bowchung Consulting; 2015.
45. Naya Ngarra Productions. A sexual health awareness and education campaign. NSW: NSW sexually transmissible infections programs unit 2015.
46. Mental Health Commission. Strong Spirit Strong Mind metro project: campaign evaluation. Perth, WA: Mental Health Commission; 2016. Available from: http://www.healthinfonet.ecu.edu.au/key-resources/programs-projects?pid=1282
47. Consulting I. 'It's Your Choice, Have a Voice' Evaluation of an arts-based sexual & reproductive health and alcohol & other drugs campaign. Surry Hills, NSW: Aboriginal Health and Medical Research Council; 2012.

48. Black A. Evidence of effective interventions to improve the social and environmental factors impacting on health: informing the development of ndigenous Community Agreements. Canberra: Commonwealth of Australia; 2007.
49. Australian National Council on Drugs. Indigenous drug and alcohol projects: elements of best practice. Canberra: Australian National Council on Drugs; 2004.
50. Midford R, Maclean S, Catto M DO. Review of volatile substance use among Indigenous people. Australian Indigenous HealthInfoNet; 2010.
51. Marel C, MacLean S, Midford R. Review of volatile substance use among Aboriginal and Torres Strait Islander people. Australian Indigenous HealthInfoNet; 2015.
52. Joudo J. Responding to substance abuse and offending in Indigenous communities: review of diversion programs. Canberra: Australian Institute of Criminology; 2008.
53. d'Abbs P, MacLean S. Volatile Substance Misuse: a review of interventions. Canberra: Department of Health and Ageing; 2008.

Appendix

Medline search results

Medline search 07/03/2017

#	Search	Results
1	indigenous.mp. or exp Oceanic Ancestry Group/	31742
2	aborigin*.mp.	8494
3	torres strait island*.mp.	1066
4	exp Indians, North American/ or "native american*".mp.	15453
5	inuit.mp. or exp Inuits/	4665
6	maori.mp.	2578
7	"first nation*".mp.	3628
8	metis.mp.	299
9	"american Indian*".mp.	5554
10	"Native Hawaiian".mp.	624
11	or/1-10	58253
12	exp Adolescent/ or adolescen*.mp.	1846860
13	youth*.mp.	61504
14	"young people".mp.	20966
15	"young adult*".mp. or exp Young Adult/	628764
16	exp Child Behavior/ or exp Psychology, Child/ or exp Child Development/ or child*.mp. or exp Child/	2145573
17	teenage*.mp.	18368
18	juvenile*.mp.	79714
19	or/12-18	3423426
20	vulnerable.mp. or exp Vulnerable Populations/	64201
21	"at risk".mp.	139476
22	disadvantaged.mp.	10126
23	20 or 21 or 22	209553
24	11 and 19 and 23	1073
25	11 and 19	18069
26	alcohol drinking.mp. or exp Alcohol Drinking/	61705
27	tobacco smoking.mp. or exp Smoking/	137536
28	nicotine.mp. or exp Nicotine/	39452

29 illicit drugs.mp. or exp Street Drugs/ 13662

30 substance abuse.mp. or exp Substance-Related Disorders/ 262955

31 "substance misuse".mp. 1847

32 "drug abuse".mp. 15676

33 "polydrug use".mp. 569

34 exp Substance Abuse, Intravenous/ or "injecting drug use".mp. 14258

35 cannabis smoking.mp. or exp Marijuana Smoking/ 3728

36 mari?uana.mp. 16310

37 opioids.mp. 24495

38 opiates.mp. or exp Opiate Alkaloids/ 85128

39 exp Heroin Dependence/ or exp Heroin/ or heroin.mp. 17201

40 methadone.mp. or exp Methadone/ 15026

41 inhalant abuse.mp. or exp Inhalant Abuse/ 366

42 gasoline.mp. or exp Gasoline/ 5990

43 exp Petroleum/ or petroleum.mp. 21304

44 "petrol sniffing".mp. 47

45 amphetamine.mp. or exp Amphetamine/ or exp Amphetamine-Related Disorders/ 29443

46 methamphetamine.mp. or exp Methamphetamine/ 11586

47 exp Central Nervous System Stimulants/ or stimulants.mp. 97757

48 psychoactive drugs.mp. or exp Psychotropic Drugs/ 338677

49 hallucinogens.mp. or exp Hallucinogens/ 23510

50 "designer drugs".mp. or exp Designer Drugs/ 1700

51 "pharmaceutical drug misuse".mp. or exp Prescription Drug Misuse/ 9930

52 exp Opioid-Related Disorders/ or opioid abuse.mp. 22027

53 or/26-52 941739

54 intervention.mp. 465493

55 exp Counseling/ or counselling.mp. 55869

56 prevention.mp. or exp Secondary Prevention/ or exp Primary Prevention/ 602577

57 treatment.mp. or exp Therapeutics/ 6582251

58 exp Social Support/ or support.mp. 8623821

59 therapy.mp. 2110411

60 exp Health Services Accessibility/ or "health care access".mp. 96062

61 referral.mp. or exp "Referral and Consultation"/ 125773

62 program*.mp. or exp Program Development/ 820149

63 policy.mp. or exp Health Policy/ or exp Policy/ or exp Policy Making/ 256284

64 policies.mp. 71092

65 "social services".mp. or exp Social Work/ 20842

66 family health.mp. or exp Family Health/ 25301

67 rehabilitation.mp. or exp Rehabilitation/ 353894

68 diversion.mp. 20662

69 "harm reduction".mp. or exp Harm Reduction/ 4297

70 "harm minimisation".mp. 141

71 "early intervention".mp. 14708

72 "peer led intervention".mp. 38

73 or/54-72 14325339

74 "population-based".mp. 100567

75 "justice settings".mp. 116

76 exp Prisoners/ or exp Prisons/ or "correctional settings".mp. 20721

77 74 or 75 or 76 121288

78 73 or 77 14354551

79 exp Treatment Outcome/ or outcome measure*.mp. 961195

80 program indicator.mp. or exp Program Evaluation/ or exp Evaluation Studies as Topic/908455

81 "program effectiveness".mp. 1294

82 "program impact".mp. 441

83 "policy evaluation".mp. 333

84 "evaluation stud*".mp. 349820

85 or/79-84 1961285

86 australia.mp. or exp Australia/ 148573

87 "New Zealand".mp. or exp New Zealand/ 60967

88 Canada.mp. or exp Canada/ 166728

89 USA.mp.81437

90 exp United States/ or "united states of america".mp. 1227499

91 or/86-90 1621064

92 53 and 78 613589

93 24 and 92 178

94 85 and 91 and 93 26

95 limit 94 to yr="2007 -Current" 20

96 remove duplicates from 95 20

97 limit 96 to (english language and humans) 20

98 25 and 53 and 78 and 85 and 91 223

99	limit 98 to (english language and humans and yr="2007 -Current")	134