



# Emergency department violence interventions

## Toolkit technical report

Hannah Gaffney, Darrick Jolliffe, and Howard White

November 2021

*This report is produced in collaboration with staff from the Campbell Collaboration Secretariat. It is a derivative product, which summarises information from Campbell systematic reviews, and other reviews, to support evidence-informed decision making’.*

*The Campbell Collaboration thank Suchi Malhotra for the AMSTAR coding of included reviews (second coder).*

## **Emergency department violence interventions: YEF Technical Report**

*Hannah Gaffney, Darrick Jolliffe, and Howard White*

### **Abstract/Plain Language summary**

The report presents findings related to emergency department (ED) based violence prevention programmes including their effect on children's involvement in crime and violence. ED-based violence intervention programmes provide individualised case management for individuals that present with injury due to violence and may also provide additional support on discharge including referral to appropriate community services.

Since the target individual has recently been the victim of violence, they may be more receptive to support and advice. That is, their presence in ED is a teachable moment which may increase the individuals' motivation to change. Navigators (i.e., professionals involved in ED-based violence prevention programmes) are often people with lived experience who work with hospital staff at weekends to connect patients presenting with issues related to alcohol, violence or drugs to services on discharge. It is also possible that the health care professionals are viewed as more trusted providers of support than other agencies such as those in the criminal justice system. Finally, many ED-based violence intervention programmes appear to provide tailored support addressing a range of needs, which might be more effective than unitary interventions such as CBT.

This report is based on the systematic review by Brice & Boyle (2020) who report findings from 13 studies, all in the USA. This review contained three studies with offending outcomes, one of which is for adults (18 and above), one is for those aged 10-24, and one with no age restriction. All three programmes provided various forms of support in hospital: a six-step intervention programme delivered by a Violence Prevention Coordinator, meetings with a social worker and a probation officer who were taking part in the programme to devise a "service plan, and an assessment to identify the psychological needs of the patient and appropriate services to address these needs. All three also provided post-discharge support for up to six months, though in the case of one study this support was only given to one of the two treatment arms. The authors of this technical report conducted a meta-analysis on two studies to produce an estimated average effect size for offending.

The review by Brice & Boyle (2020) is assessed as low confidence using AMSTAR 2. In addition, the results are highly heterogeneous ( $I^2 = 82.4\%$ ) and the number of studies included in the meta-analysis is very low ( $n = 2$ ), so the overall evidence rating for the impact is 1.

Overall, ED programmes have a large desirable impact on offending outcomes with a mean effect size of OR = 2.25, which is equivalent to a 38% reduction in crime and violence. But this result is based on a small number of studies.

Implementation evidence from London and Glasgow emphasizes the importance of a good relationship between patients and the navigator, which in the Glasgow case is achieved by employing people with lived experience. Not all those offered the service take it, with CYP

being suspicious of authority and not willingly sharing information. The post discharge follow up is identified as an important success factor.

No cost data are available.

More primary studies are needed, which will enable an updated review which includes moderator analysis.

## **Objective and approach**

The objective of this technical report is to review the evidence on the effect of emergency department (ED) based violence prevention programmes on children and young people's involvement in crime and violence.

This technical report is based on one systematic review by Brice and Boyle (2020). This is a review of ED-based violence intervention programmes on a range of different outcomes, including youth violence and reoffending. The authors of the review did not conduct a meta-analysis. The impact estimate is informed by a meta-analysis of two primary evaluations included by Brice and Boyle (2020), conducted by the authors of this technical report (i.e., Cooper et al., 2006; Zun et al., 2006).

The following inclusion and exclusion criteria were used to inform selection of systematic reviews.

### *Inclusion criteria*

To be included in this report, a systematic review must include evaluations of violence intervention and/or prevention programmes implemented in emergency departments. Reviews must have reported the effect of programmes on quantitative measures of relevant outcomes, such as later involvement in violence or violent reoffending.

### *Exclusion criteria*

Reviews were excluded for the following reasons:

- The focus of the review was not on children and young people, or evaluations included only adult participants.
- The review included evaluations that focused only on violence that was a result of intimate partner violence, sexual assault, or child maltreatment/abuse.

## **Outcomes**

Brice and Boyle (2020) examined the effectiveness of ED based violence intervention programmes on a range of outcomes, including, violent reinjury, arrest for violence perpetration, and death caused by violence. ED-based violence intervention programmes target patients who present with injuries that were caused by participation in violence, and so, violent reinjury refers to the reoccurrence of involvement in violence.

Two primary evaluations of ED based violence intervention programmes were used to estimate an impact estimate. These studies were chosen as they reported the effects of the intervention on offending outcomes (i.e., arrests, arrests for violence, incarceration, incarceration for violence, and convictions).

## **Description of interventions**

ED-based violence intervention programmes include strategies to provide individualised case management for individuals that present with injury due to violence. Patients may also be referred to appropriate community services (Brice & Boyle, 2020).

The results of two evaluations were used in the current technical report to estimate the impact of ED-based violence intervention programmes on children and young peoples' involvement in crime and violence (i.e., Cooper et al., 2006; Zun et al., 2006).

- Cooper et al. (2006) evaluated a “culturally sensitive” violence intervention for patients admitted to the emergency department for injuries due to violence. No further information on the culturally sensitive aspects of the intervention is provided. Eligible participants were those aged 18 and over, who had previously been admitted to hospital for injuries as a result of violence and who were already involved in the criminal justice system (i.e., those on parole or probation). Patients first met with a social worker and a probation officer who were taking part in the programme to devise a “service plan”. This was an outline of the various intervention components specific to that patients' case. Components included substance abuse rehabilitation, employment training, education, conflict resolution training, and family development (Cooper et al., 2006). Regular meetings between the patient, social worker and probation officer were scheduled and home visits by members of the violence intervention programme were also arranged. Weekly meetings occurred where team members, including social workers, probation officers, psychiatrists and professionals from other medical backgrounds like trauma and critical care, discussed the progress of active cases (Cooper et al., 2006).
- Zun et al. (2006) evaluated an ED-based violence intervention programme implemented with patients aged 10 – 24 years who were admitted to hospital with injuries occurring as a result of interpersonal violence. Patients were initially assessed in the emergency department (or at home) with a comprehensive tool developed specifically for the study by an ED physician, social worker and a public health expert (Zun et al., 2006). This assessment identified the psychological needs of the patient and then identified appropriate services to address these needs. Patients' cases were managed for six months and case managers provided patients with access to a range of services, including, primary and preventative healthcare, social services, anger management, and conflict resolution training. Case managers and the patients met weekly for the first two months of the intervention, and then fortnightly for the next two months. Meetings took place monthly for the final two months of the intervention (Zun et al., 2006).

#### *Targeted or Universal*

ED-based violence intervention programmes are a targeted intervention approach. These are an example of interventions that are implemented directly with children and young people involved in violence. In this case, these individuals are targeted when they present to an emergency department for treatment of injuries caused by, or suspected to be caused by, violence. ED-based violence intervention programmes can also target specific areas, as is the case in the evaluations by Aboutanos et al. (2011), Cooper et al. (2006), and Zun et al. (2006), where the interventions were implemented in ED A&E departments of hospitals in inner city or urban areas where the rate of children and young people involved in crime and violence was known to be high.

### *Implementation setting and personnel*

As the name suggests, these intervention programmes are implemented in emergency departments of hospitals.

A range of professionals may implement ED-based violence intervention programmes, and not typically on a one-to-one (CYP and intervention professional). These can include social workers, probation officers, criminal justice professionals, trained intervention facilitators or medical professionals like doctors and nurses who work in emergency medicine. For example, Cooper et al. (2006) evaluated an intervention whereby a young person's case was managed by two professionals (social worker and a parole/probation officer) and were then referred to other professionals in a range of possible agencies.

### *Duration and Scale*

The interventions included by Brice and Boyle (2020) varied in intensity and length. All three interventions included treatment after discharge, in one case with regular meetings for six months (Aboutanos et al., 2011). The evaluations typically used a 6-month follow-up time point. However, some evaluations followed up with participants for up to 2 years after initial assessment.

### **Theory of change/presumed causal mechanisms**

There are a number of possible ways that ED-based violence intervention programmes may have an impact. As the target individual has recently been the victim of violence, they may be more receptive to support and advice. This is akin to a 'teachable moment' or a 'very brief intervention'<sup>1</sup> and may increase the individuals' motivation to change.

It is also possible that the health care professionals are viewed as more trusted providers of support than other agencies such as those in the criminal justice system. Finally, many ED-based violence intervention programmes appear to provide tailored support addressing a range of needs, which might be more effective than unitary interventions such as CBT.

### **Evidence base**

#### *Descriptive overview*

Brice and Boyle included two evaluations of ED-based violence intervention programmes that were used in the meta-analysis (i.e., Cooper et al. 2006; Zun et al., 2006). As reported by Brice and Boyle (2020) these evaluations reported the effects of ED-based violence intervention programmes on offending outcomes. A brief descriptive overview of these evaluations is now provided:

- Cooper et al. (2006) evaluated the impact of an ED-based violence intervention programme in the USA with 100 patients. Approximately half of the patients ( $n = 56$ ) were randomly assigned to the treatment group and the remaining patients served as the control group ( $n = 44$ ). Most of the participants were male in both groups (95% treatment group; 98% control group) and most were under 30 years old (52%

---

<sup>1</sup> NICE guidelines describe the purpose of a 'very brief intervention' as a way to give information to patients or to direct them to further services for additional help whilst encouraging behaviour change and support.

treatment group; 59% control group). The majority of participants identified as Black (87% treatment group; 38% control group).

- Zun et al. (2006) evaluated the impact of an ED-based violence intervention programme in the USA using a quasi-experimental design with 188 children and young people aged 10 to 24 years old ( $n = 96$  in treatment group at Wave 1 of data collection and  $n = 92$  in the control group). After 12 months follow up data were collected from 120 youth ( $n = 62$  treatment group,  $n = 58$  control group). The treatment group was comprised of mostly 15- to 19-year-olds ( $n = 49$ ) or 20- to 24-year-olds ( $n = 32$ ). Only 12 individuals aged 10- to 14-year-olds were included in the treatment group. Most of the participants were male ( $n = 82$ ,  $n = 11$  females) and identified as African American ( $n = 61$ ;  $n = 28$  Hispanic,  $n = 2$  White,  $n = 2$  other ethnicity).

### *Assessment of the strength of evidence*

We have confidence that, at the time of writing, the review by Brice and Boyle (2020) is the best available evidence on the effectiveness of ED-based violence intervention programmes. Our decision rule for determining the evidence rating is summarised in the technical guide.

Two independent coders used a modified version of the AMSTAR2 critical appraisal tool was used to appraise the review by Brice and Boyle (2020). According to this tool, the review by Brice and Boyle (2020) was rated 'low'. The results are summarised in Annex 3.

The review adequately specified the research questions and the inclusion/exclusion criteria. The inclusion criteria included components relating to the population, intervention, comparison group and outcome of interest. Brice and Boyle (2020) included evaluations of violence prevention programmes that were initiated or performed in the emergency department of a hospital for patients with injuries occurring as a result of community violence. The outcomes specified for inclusion were extensive, for example, the primary outcomes were violent reinjury, arrests due to violence, death due to violence, and the secondary outcomes included attitudes towards violence and high-risk behaviours.

Brice and Boyle (2020) did not state that they created a review protocol before undertaking the review or whether the protocol was published.

Brice and Boyle (2020) restricted their inclusion criteria to only include randomised controlled trials.

The review reported a comprehensive literature search strategy including several different databases, designated keywords, and search strategies. The inclusion criteria were restricted to only academic or peer-reviewed journals published in any language. One author reviewed the titles and abstracts of search results. There is no mention of double coding.

Brice and Boyle (2020) did not provide any information about funding for the review and did not declare any competing interest.

The review did not include a meta-analysis. The meta-analytical synthesis of effect sizes for primary outcomes was performed for the purpose of this technical report. The direct estimate of the effect on offending based on 2 studies and 6 effect sizes. The results are highly heterogeneous ( $I^2 = 82.4\%$ ) and the review rated 'low' as per the AMSTAR tool, so the overall evidence rating for the impact is 1.

This is our preferred headline estimate for effects on violence and crime outcomes, but a full systematic review and meta-analysis is needed as there are several other relevant outcomes that could be included.

## Impact

### *Summary impact measure*

Based on the meta-analysis performed for the current technical report, the findings suggest that ED-based violence intervention programmes have a large desirable impact on offending outcomes.

The mean effect size was OR = 2.25 (SE = 0.78,  $p = 0.488$ ). There was a significant amount of heterogeneity between effect sizes ( $I^2 = 82.4\%$ ) and this mean effect is based on dependent effect sizes from only two studies. Whilst the dependence between effects was accounted for in a robust variance estimation model of meta-analysis, more evaluations are needed to better understand the impact of ED-based violence interventions on offending outcomes. More information on how this mean effect was computed is provided in the technical guide. The evaluation by Aboutanos et al. (2011) was not included in the meta-analysis as there was no appropriate control group (i.e., two experimental groups were included in the evaluation were: (1) hospital case management, and (2) hospital case management plus follow up services).

The effect sizes for primary evaluations are summarised in Table 1.

Table 1

### *Effect sizes for crime and violence outcomes*

Study	Design	Outcome	OR	CI (ES)
Cooper et al. (2006) <sup>a</sup>	RCT	Arrests	2.16	1.97 – 2.37
Cooper et al. (2006) <sup>a</sup>	RCT	Arrests for violence	5.75	5.27 – 6.28
Cooper et al. (2006) <sup>a</sup>	RCT	Convictions	5.47	5.08 – 5.89
Cooper et al. (2006)	RCT	Convictions for violence	8.4	7.39 – 9.54
Zun et al. (2006)	EC	Arrests	0.98	0.81 – 1.18
Zun et al. (2006)	EC	Convictions	1.07	1.01 – 1.14

*Note.* RCT = randomised controlled trial; EC = experimental-control comparison on post-intervention data; CI = 95% confidence intervals for the ES; OR = odds ratio; OR > 1 represents a desirable intervention effect (i.e., a reduction in arrests); OR < 1 represents an undesirable intervention effect (i.e., an increase in arrests); OR = 1 represents a null intervention effect; Cooper et al. (2006) do not

specify if the results for ‘convictions’ also included ‘convictions for violence’ or if these outcomes were independent of one another.

To best communicate the impact of ED-based violence intervention programmes, we can transform the mean effect size to a percentage relative change in offending outcomes. The odds ratio of 2.25 corresponds to a 38.46% relative reduction in offending and violence. The method for estimating the percentage relative reduction is described in Annex 1.

#### *Moderators and mediators*

Brice and Boyle (2020) did not compute a meta-analysis, and as such, no moderator analyses were computed either.

Future meta-analyses should examine the impact of moderators like age on effect size as there was significant heterogeneity between the effect sizes. For example, Cooper et al. (2006) included adult participants (i.e., those over the age of 18) whilst Zun et al. (2006) and Aboutanos et al. (2011) included children and young people under the age of 25 years old. Another possible moderator to examine would be the difference between brief interventions, implemented only in the emergency department, and interventions involving aftercare and case management services. However, there appear to be too few primary studies at present to conduct a statistical analysis of moderators.

#### **Implementation and Cost analysis**

Three studies of two interventions are available for evidence related to implementation: (i) Youth services provided at a London hospital, comprising direct work (one-to-one sessions) and referral to external projects, with 90 CYP receiving the intervention during the study period (Llan-Clark et al., 2013); and (ii) The Navigator Programme in Glasgow Royal Infirmary. In Glasgow, navigators are people with lived experience who work with hospital staff at weekends to connect patients presenting with issues related to alcohol, violence or drugs to services on discharge. During first 12 months support was provided to 209 patients (Magil et al., no date, and Jameson et al., 2017). See Annex 2 for a summary of the data extracted from these studies.

Success factors were identified as being: (i) forming a connection with the client, which means the navigator should be someone they can relate to; (ii) engaging the client as soon as possible, offering a range of modalities; (iii) maintaining contact after discharge; and (iv) work with the client to break the cycle of violence. In the case of the Glasgow Navigator Programme the connection was ensured by having staff with lived experience. In words of one youth worker:

*They have got personal experience, and they the patients and that makes a big difference.*

Not all those offered the service accept it – in both cases about one-third of those referred did not take up the service, some because they are not traceable after discharge. Better communication with CYP and their families pre-enrolment may increase retention. Moreover, referrals may not be made at all in some relevant cases as young people don’t give the true reason for their injury. In the words of one young person:

*If you feel, if someone came and approached me, and if I got stabbed and if I was involved in a gang or something, then I was like 'uh I don't really want to tell that person nothing.*

And regarding support on discharge:

*It's not just seeing them in the department, they follow it up, they see them in the community... I think it gives the person more support...*

Moreover, many hospital staff are insufficiently aware of the programme, with the programme office some way from the ward. The latter may be addressed by the staff of the navigator programme being present on the ward and getting to know people.

Finally, CYP may be reluctant to engage as they distrust authority, and there may be risks in being seen to engage with officials as it may lead to suspicion of police involvement. The Navigator programme in Glasgow, described in the next section, uses people with lived experience as Navigators which thus reduces this problem, and facilitates successful connection. In the words of one young person: *"They have got personal experience, and they the patients and that makes a big difference"* (quoted in Jameson et al., 2017).

No cost data are available.

### **Findings from UK/Ireland**

The review by Brice and Boyle (2020) did not include any evaluations of ED-based violence interventions implemented in the United Kingdom or Ireland. The implementation analysis reports one study from London and one from Glasgow.

The Glasgow Navigator Programme works with people attending A&E with injury or illness associated with violence, alcohol or drugs, which includes but is not exclusively for young people. Magil et al. (no date) compare the number of ED visits for those who are provided the service and those who decline it. ED attendance fell by 24% in those using the service and grew by 1% in those declining it. However, these two groups are not comparable, with the those who used the service having a much higher number of ED visits in the 12 months prior to the intervention, and the absolute number remaining higher than those who declined also in the 12 months after the intervention (i.e, whilst attendance fell it was still higher).

### **What do we need to know? What don't we know?**

We need to conduct an updated systematic review of ED-based violence intervention programmes that also includes a meta-analysis of all relevant outcomes. But more primary studies, preferably with larger samples, are also needed.



## References

Aboutanos, M. B., Jordan, A., Cohen, R., Foster, R. L., Goodman, K., Halfond, R. W., Poindexter, R., Charles, R., Smith, S. C., Wolfe, L. G., Hogue, B., & Ivatury, R. R. (2011). Brief violence interventions with community case management services are effective for high-risk trauma patients. *Journal of Trauma: Injury, Infections, and Critical Care*, 71(1), 228 – 237. <https://doi.org/10.1097/TA.0b013e31821e0c86>

Brice, J. M., & Boyle, A. A. (2020). Are ED-based violence intervention programmes effective in reducing revictimisation and perpetration in victims of violence? A systematic review. *Emergency Medicine Journal*, 1 – 7. <https://doi.org/10.1136/emered-2019-208970>

Cooper, C., Eslinger, D. M., & Stolley, P. D. (2006). Hospital-based violence intervention programs work. *Journal of Trauma: Injury, Infection, and Critical Care*, 61, 534 – 540.

Jameson, J., Lowe, D. & Goodall, C. (2017) Breaking the cycle of violence: emergency staff perceptions of the Navigator programme. Poster Presentation at the 11<sup>th</sup> European Congress on Emergency Medicine, Athens, Greece.

Magill, S., Whitelaw, A., Lowe, D., Ireland, A. & Goodall, C. (no date) The Navigator Programme: A novel way to reduce presentations to the Emergency Department. Poster Presentation.

Zun, L. S., Downey, L., & Rosen, J. (2006). The effectiveness of an ED-based violence prevention program. *American Journal of Emergency Medicine*, 24, 8 – 13. <https://doi.org/10.1016/j.ajem.2005.05.009>

## Annex 1: Effect size calculations

This annex shows the calculations based on the results and assumptions given in the text. We assume 200 youth, evenly divided between treatment and comparison groups. That means there are 100 youth in the control group and 100 youth in the treatment group. Assuming that 50% of youth in the control group reported offending, the mean effect size estimated in this technical report can be easily transformed to a percentage reduction in the relevant outcome.

If the odds ratio for offending is 2.25, then using the table below and the formula for an OR, we can estimate the value of X. The odds ratio is estimated as:  $A \cdot D / B \cdot C$ , where A is the number of children and young people not involved in crime and violence in the treatment group, B is the number of children and young people involved in crime and violence in the treatment group, C is the number of children and young people not involved in crime and violence in the control group, and D is the number of children and young people involved in crime and violence in the control group. Therefore, the value of X is 30.77.

	No offending	Offending	Total
Treatment	100-x	x	100
Control	50	50	100

Therefore, the relative reduction in delinquency is  $(50 - 30.77)/50 * 100 = 38.46\%$ .

The prevalence of involvement in crime and violence is likely to vary between different studies and can be influenced greatly by the type of report (e.g., self-report or parent-report), the survey used, the questions asked (e.g., frequency of offending in the past couple of months versus the frequency of offending in the past year, or ever), or the type of offences. If we were to adjust our assumption that 50% of the control group are involved in crime and violence, the relative reduction in the treatment group is not greatly affected.

For example, if we assume that 40% of the control group were involved in crime and violence, the 2x2 table would be as follows and the value of X would be 22.86. Therefore, the relative reduction is 42.6% (i.e.,  $(40 - 22.96)/40 * 100$ ).

	No offending	Offending	Total
Treatment	100-x	x	100
Control	60	40	100

Similarly, if we assume that 60% of the control group are involved in crime and violence, the value of X is 40, and the relative reduction in delinquency is 33.33%. Given, the dramatic difference in the assumed prevalence of delinquency, the percentage relative reduction does not vary greatly.

## Annex 2: Implementation analysis

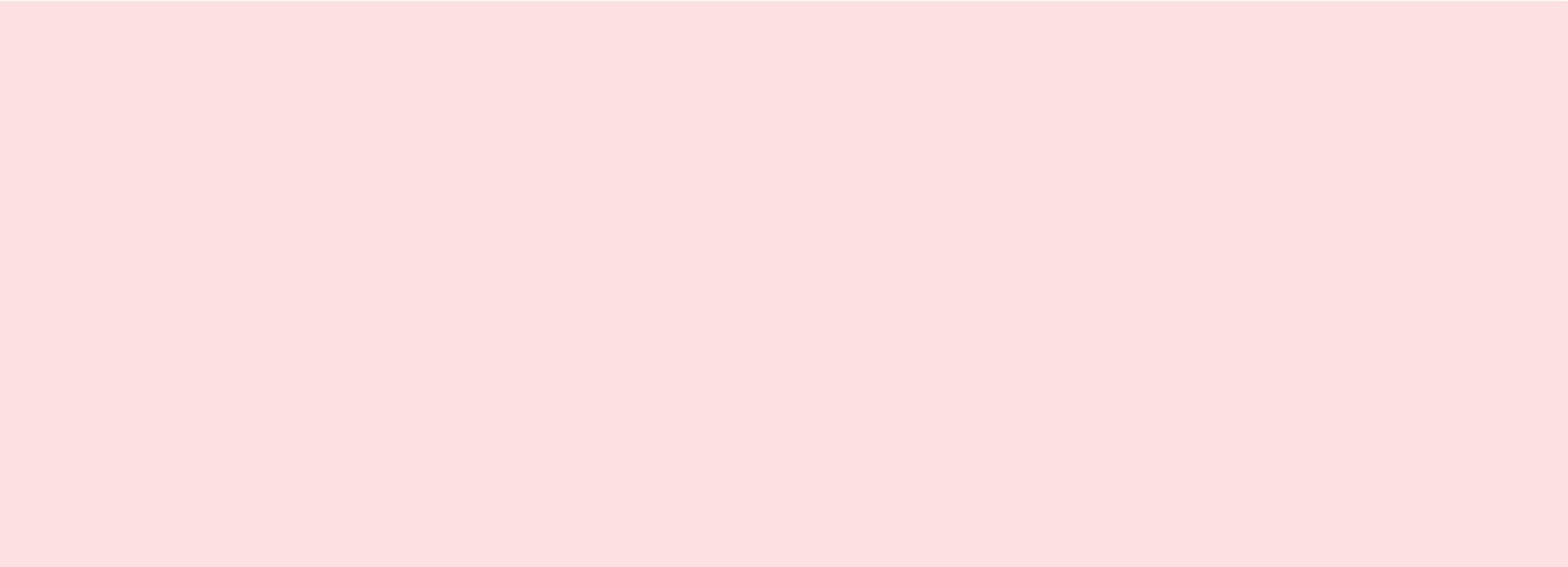
Study / intervention	Success factors (facilitators)	Challenges (barriers)	What CYP and staff say
<p>Llan-Clark et al. (2013) Youth services provided at a London hospital, comprising direct work (one-to-one sessions) and referral to external projects.</p>	<p>A non-intrusive approach as youth suspicious of people asking questions.</p> <p>The youth worker should be someone CYP can relate to.</p> <p>Engage CYP as soon as possible after admission.</p> <p>Choice of modality (individual/group; include family members)</p>	<p>Of 505 CYP, 2/3 were eligible, but 1/3 refused or were not contactable. 90 entered the intervention with the other 79 were not seen or went to alternative service.</p> <p>Sixty percent of hospital staff not aware/only a bit aware of the programme. Low visibility of the service and poor communication between staff – presence on ward and getting to know people is best.</p> <p>CYP mistrust authority. Engaging with police will lose trust of peers and may be dangerous.</p> <p>Potential referrals missed as CYP don't give real reason for being there.</p>	<p>They (YP) don't want to let out too much information, people are very touchy about that. They would rather act like [...] If you feel, if someone came and approached me, and if I got stabbed and if I was involved in a gang or something, then I was like 'uh I don't really want to tell that person nothing.</p> <p>One young person remarked how being seen talking in ED to someone official could have very negative consequences if witnessed by a rival gang member, leading to suspicion of police involvement.</p> <p>If there are people there you know and trust, you know that they are not going to doubt you, but if you have got people coming in,</p>

			acting like they have known you from there, like you can't tell them stuff [y] but you will be a lot more wary.
Magil et al. (no date) and Jameson et al. (2017) The Navigator Programme in Glasgow Royal Infirmary. Navigators are people with lived experience. They work with hospital staff at weekends to connect patients presenting with issues related to alcohol, violence or drugs to services on discharge. During first 12 months support was provided to 209 patients.	<p>Connect: Navigators can connect with patient because of shared experience.</p> <p>Support: Within and outside ED. Navigators maintain connection after discharge.</p> <p>Stability: help break cycle of violence.</p>	Acceptance is not universal: of 100 people offered the programme 37 declined.	<p>They have got personal experience, and they the patients and that makes a big difference.</p> <p>It's not just seeing them in the department, they follow it up, they see them in the community... I think it gives the person more support...</p> <p>It seems to be quite a holistic approach.. looking at all the different things. So if someone's got an addiction they help with that but also looking at getting folk into work ... is it's easy to get someone detoxed but if you've no connection, if you've no meaningful work there's not much to keep you sober.</p>



### Annex 3: AMSTAR Rating

Modified AMSTAR item		Scoring guide	APPROACH NAME
			Brice & Boyle (2020)
1	Did the research questions and inclusion criteria for the review include the components of the PICOS?	To score 'Yes' appraisers should be confident that the 5 elements of PICO are described somewhere in the report	Yes
2	Did the review authors use a comprehensive literature search strategy?	At least two bibliographic databases should be searched (partial yes) plus at least one of website searches or snowballing (yes).	Yes
3	Did the review authors perform study selection in duplicate?	Score yes if double screening or single screening with independent check on at least 5-10%	No
4	Did the review authors perform data extraction in duplicate?	Score yes if double coding	No
5	Did the review authors describe the included studies in adequate detail?	Score yes if a tabular or narrative summary of included studies is provided.	Yes
6	Did the review authors use a satisfactory technique for assessing the risk of bias (RoB) in individual studies that were included in the review?	Score yes if there is any discussion of any source of bias such as attrition, and including publication bias.	No
7	Did the review authors provide a satisfactory explanation for, and discussion of, any heterogeneity observed in the results of the review?	Yes if the authors report heterogeneity statistic. Partial yes if there is some discussion of heterogeneity.	NA
8	Did the review authors report any potential sources of conflict of interest, including any funding they received for conducting the review?	Yes if authors report funding and mention any conflict of interest	No  Low





[www.youthendowmentfund.org.uk](http://www.youthendowmentfund.org.uk)

The Youth Endowment Fund Charitable Trust

Registered Charity Number: 1185413