

# Effectiveness of Harm Reduction Strategies for Persons Who Use Psychostimulants: A Systematic Review

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# BACKGROUND

- Drug overdose deaths involving cocaine and psychostimulants have increased
- Psychostimulants include drugs such as methamphetamine, 3,4-methylenedioxymethamphetamine (MDMA).
- In 2017, 19.8% of drug overdoses involved cocaine, 14.7% involved psychostimulants
- ODs from cocaine or PS have increased 34% and 33% from 2016-2017
- These increases indicate a need for effective prevention interventions

Table 3 Brief summary of findings.

	Abstinence	Use	Retention	Harms
<b>All Antidepressants</b>	★★	∅	★★	★
<b>Aminoketone:</b> Bupropion	★	★	★★	∅
<b>Atypical Antidepressant:</b> Mirtazapine	NA	∅	∅	∅
<b>SSRI:</b> Sertraline	∅	NA	∅	NA
<b>Atypical Antipsychotics:</b> Aripiprazole	∅	★	∅	∅
<b>Psychostimulants and Other Medications for ADHD</b>				
<b>All Psychostimulants:</b> Modafinil, Dexamphetamine, Methylphenidate	★	∅	★	NA
Methylphenidate	NA	★	★	NA
Atomoxetine	NA	∅	∅	∅
<b>All Anticonvulsant and Muscle Relaxants:</b> Baclofen, Gabapentin, Topiramate	∅	∅	∅	∅
Topiramate	NA	★	★	★
<b>Medications used for other substance use disorders</b>				
Naltrexone	∅	★	★	★★
Varenicline	NA	∅	∅	∅

Shading represents the direction of effect:

(No color)	Unclear
Grey	No difference
Green	Evidence of benefit
Red	Favors placebo

Symbols represent the strength of the evidence:

NA	No evidence or not applicable
∅	Insufficient
★	Low
★★	Moderate
★★★	High

No FDA  
Approved  
Medication for  
Psychostimulant  
Use Disorder

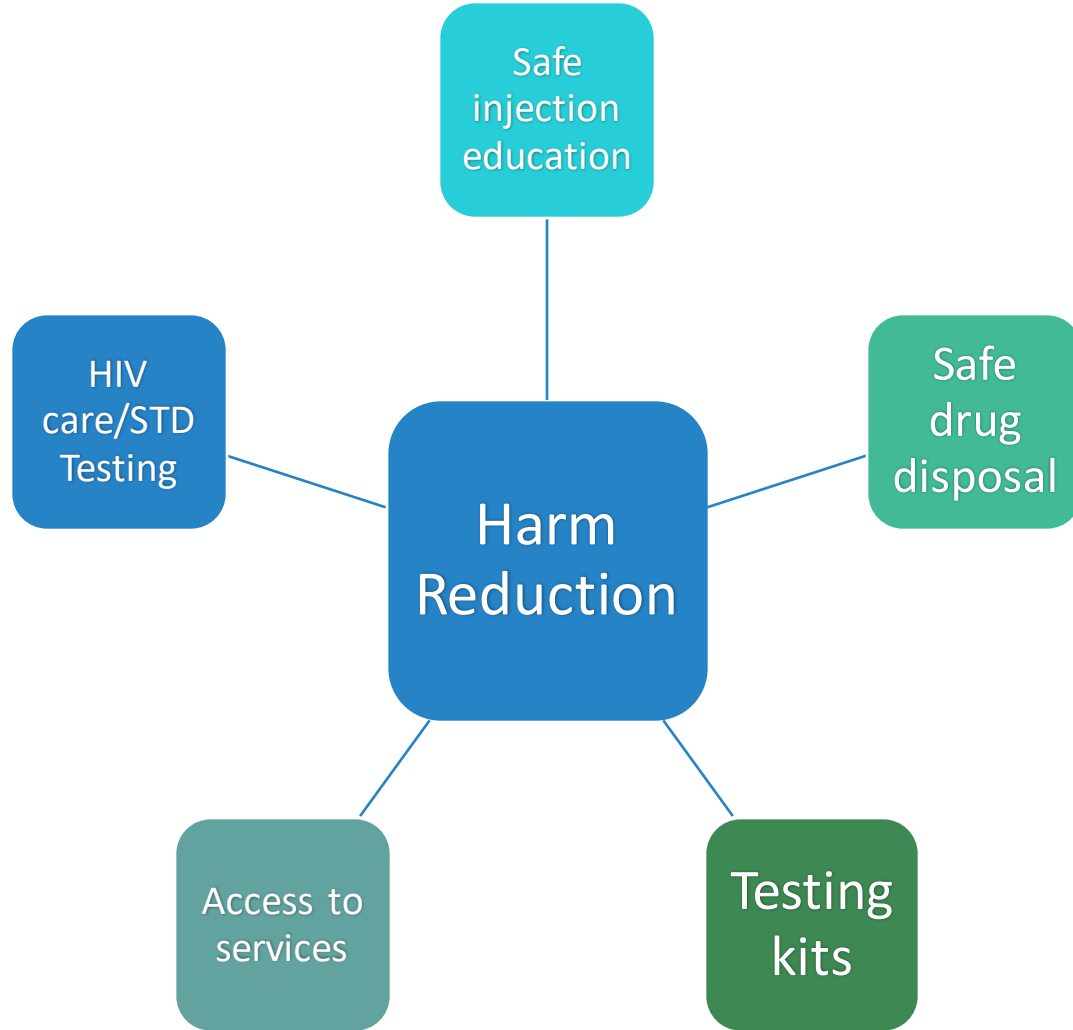
EVIDENCE-BASED RESOURCE GUIDE SERIES

## Treatment of Stimulant Use Disorders



## Treatment of Stimulant Use Disorder: SAMHSA Evidence Based Resource Guide

- Motivational Interviewing (MI)
- Cognitive Behavioral Therapy
- Community Reinforcement Approach
- Contingency Management/Voucher Incentives



# HARM REDUCTION

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The goal is to reduce the harmful consequences associated with a certain behavior without targeting the behavior itself.

# RESEARCH QUESTION

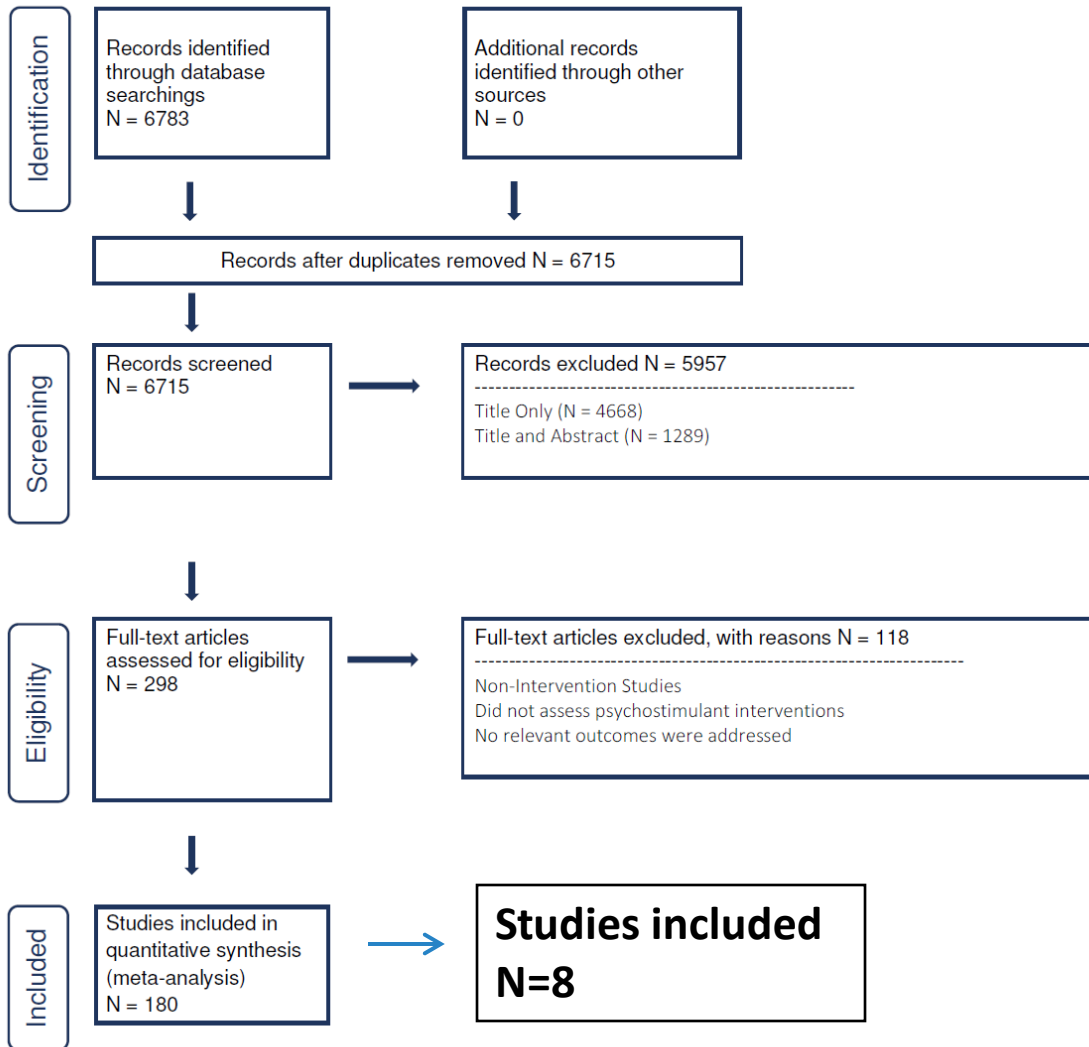
- The purpose of this review is to examine the effectiveness of harm reduction interventions aimed at decreasing cocaine and psychostimulant use, initiation and overdose.
- **Review Question:**
  - How effective are harm reduction interventions aimed at decreasing cocaine and psychostimulant use, initiation or overdose at decreasing drug-related behaviors and improving health outcomes?

# SEARCH STRATEGY

- Search performed in four databases:
  - MEDLINE (OVID), EMBASE (OVID), PsycINFO (OVID), CINAHL (EBSCOhost) for the years 1980 – 2019
- Search Terms
  - \*cocaine-related disorders/ OR \*crack-cocaine/ OR \*cocaine/ OR (cocaine OR psychostimulant\* OR polydrug use\* OR polydrug abuse\* OR poly-drug use\* OR poly-drug abuse\* OR cocaethylene OR amphetamine\* OR methamphetamine\* OR methylamphetamine OR adderall OR ritalin OR crystal meth OR ephedrine OR pseudoephedrine OR desoxyn).ti.
  - Substance-related disorders/ OR drug overdose/ OR (Abuse\* OR misuse\* OR mis-use\* OR drug use\* OR substance use\* OR addiction\* OR initiation OR disorder\* OR drug utilization OR overdose\*).ti,ab.
  - Prevention OR intervention\* OR legislation OR policy OR policies OR regulation\* OR drug court OR guideline\* OR recommendation\* OR education
  - Limit English ; 1980 - 2019



# FLOW DIAGRAM



- 180 included studies that examined psychostimulant interventions overall.
- For our analysis, we examined 8 of these studies which had a specific harm reduction focus.

# INCLUSION/EXCLUSION CRITERIA

- Inclusion criteria:
  - Intervention studies that aim to decrease cocaine or psychostimulant use, initiation, or overdose **and/or** includes cocaine/psychostimulant use, initiation, or overdose as a primary or secondary outcome.
  - US-based studies published in English from 1980 to 2019.
  - Intervention studies using a before–after with comparison, time series, cohort, or comparison group study or a randomized/non-randomized trial design
  - Harm reduction focus in intervention design
- Exclusion Criteria:
  - Studies that aim to decrease caffeine/energy drink consumption.
  - Studies involving animals
  - Systematic Review/Meta-Analysis

# METHODS

- Citations were reviewed by two independent coders at the title and abstract level, followed by full text review using Distiller SR v.2
- Coders extracted data from included studies on:
  - Study Characteristics (Intervention Strategy)
  - Sample Characteristics (Sample size, avg age)
  - Outcomes
    - Cocaine/Psychostimulant Use
    - Cocaine/Psychostimulant Initiation
    - Polydrug behavior
- Data were qualitatively summarized and analyzed

# RESULTS

Study Characteristics		# of studies	
		n	%
Total interventions		9	100.0%
Study Design	Randomized control trial	4	44.4%
	Before/after no comparison	3	33.3%
	Cross-over	1	11.1%
	Prospective cohort study	1	11.1%
Location	Midwest	1	11.1%
	West	5	55.6%
	South	4	44.4%
Setting	Clinic	6	66.7%
	CBO	1	11.1%
	Web based	1	11.1%
	Research institute	1	11.1%
Additional interventions tested	Behavioral therapy	5	55.6%
	Contingency/incentive based	4	44.4%
Outcomes examined	Cocaine use	8	88.9%
	Psychostimulant use	8	88.9%
	Polydrug behavior	3	33.3%
Race/Ethnicity: Majority POC	Yes	6	66.7%
	No	3	33.3%
Sex: Majority Female	Yes	2	22.2%
	No	7	77.8%

Study (Author, Yr)	Target Population	Intervention Strategies	Results
<b>MSM Users</b>			
Carrico et al., 2014 (Study 1)	Methamphetamine-using MSM	Stonewall Project Harm Reduction treatment model Compensation for time and travel	↓ Days of crack/cocaine use decreased ( <b>Cohen's d = 0.12, p-value &lt; 0.05</b> )
Carrico et al., 2014 (Study 2)	Methamphetamine-using MSM	Individual and group counseling sessions Psychoactive drugs as needed	↓ Day of meth use decreased ( <b>Cohen's d = -0.24, p-value &lt; 0.05</b> )
Reback et al., 2012	Methamphetamine-using MSM	Risk reduction messaging	↓ Methamphetamine use ( <b>Wilcoxon z = 3.53; p-value &lt; 0.001</b> )
<b>Persons who Inject Drugs</b>			
Rotheram-Borus et al., 2010	PWID	Overdose prevention program  NIDA standard intervention + skill focused workshop, individual counseling session  Support for risk reduction goals	↓ Number of times participants injected drugs ( <b>t = 0.93, p &lt; 0.001</b> ) ↓ Number of times participants used crack ( <b>t= 0.90, p-value &lt; 0.001</b> ) ↓ Number of times participants injected other drugs ( <b>t= 0.93, p-value &lt; 0.001</b> )
Fisher et al., 2003	PWID	Study of NEPs	↓ Percent positive urine tests for cocaine ( <b>F(2, 597) = 49.27, p = 0.0001</b> ).

Study (Author, Yr)	Target Population	Intervention Strategies	Results
<b>African-American Crack-Cocaine Users</b>			
Wechsberg et al., 2007	African-American male crack cocaine users	Pretreatment intervention Risk reduction skills education	↓ Days of crack use ( <b>p-value &lt; 0.001</b> )
Sterk et al., 2003	African-American female crack cocaine users	2 enhanced NIDA interventions Motivation: safer drug use education Negotiation: safer injection practices skills workshop	↓ Percent of crack cocaine use ( <b>p-value &lt; 0.001</b> ) ↓ Days of crack cocaine use ( <b>p-value &lt; 0.001</b> ) ↓ Days of crack cocaine use ( <b>p-value &lt; 0.05</b> )
McCoy et al., 2008	African-American female cocaine/heroin/crack cocaine users	Enhanced NIDA intervention with assistance initiating risk reduction behaviors	↑ 1.6 x more likely to have less drug use (crack, cocaine, speedball, heroin) ( <b>Odds ratio = 1.59 (1.06, 2.39), p-value = 0.026</b> ).
<b>Non-injecting PWUD</b>			
Cottler et al., 2011	non-injecting PWUD	Enhanced NIDA intervention with risk reduction plan development	↓ Crack/cocaine use ( <b>p-value &lt; 0.001</b> ).

# CONCLUSIONS

- All studies examined harm reduction strategies within multi-component interventions that also encompassed Behavioral Therapy or Contingency/Incentive-based Management strategies.
- All studies reported statistically significant reductions in cocaine and psychostimulant use, such as frequency of methamphetamine and crack cocaine use, and changes in polydrug behavior.



# IMPLICATIONS

- Harm reduction strategies may be effective at decreasing cocaine or psychostimulant use- related outcomes.
- Future PH research needed to examine the impact of harm reduction strategies on psychostimulant initiation and overdose outcomes.
- Harm reduction strategies will be a useful component of overdose prevention programs addressing cocaine and psychostimulants.

Questions?