

Review

Sustainable Harm Reduction Needle and Syringe Programs for People Who Inject Drugs: A Scoping Review of Their Implementation Qualities

Danielle Resiak ^{1,*} , Elias Mpofu ^{1,2,3,*}  and Rodd Rothwell ¹

¹ Faculty of Medicine and Health, The University of Sydney, Sydney 2006, Australia; rod.rothwell@sydney.edu.au

² Rehabilitation and Health Services, University of North Texas, Denton, TX 26203, USA

³ Educational Psychology Department, University of Johannesburg, Johannesburg 2092, South Africa

* Correspondence: dres2715@uni.sydney.edu.au (D.R.); elias.mpofu@sydney.edu.au (E.M.)

Abstract: While substance use disorders (SUD) continue to be a global concern, harm reduction approaches can provide sustainable harm minimization to people who inject drugs (PWID) without requiring abstinence. Yet, the evidence for the sustainable implementation of harm reduction approaches is newly emerging. This scoping review sought to map the evidence on implementation qualities of sustainable harm reduction needle and syringe programs (NSPs). We searched the Cochrane Database of Systematic Reviews, PubMed, ProQuest Central, and Directory of Open Access Journals for empirical studies (a) with an explicit focus on harm minimization NSPs, (b) with a clearly identified study population, (c) that described the specific NSP implementation protocol, (d) that provided information on accessibility, affordability, and feasibility, and (e) were published in English between 2000–2020. Following narrative qualitative synthesis, the evidence suggests individual implementer characteristics directly influenced sustainable availability and scope of NSP provision while implementation processes explained the predictability and continuity of service provision across services. External factors including community perceptions of NSPs and policing activity influenced the sustainability of NSP implementation. The emerging evidence suggests that sustainable NSP programs for PWID require provider, consumer, and community engagement, supported by enabling health policies.

Keywords: NSP; harm reduction; harm minimization; low threshold settings; PWID; sustainable implementation qualities



Citation: Resiak, D.; Mpofu, E.; Rothwell, R. Sustainable Harm Reduction Needle and Syringe Programs for People Who Inject Drugs: A Scoping Review of Their Implementation Qualities. *Sustainability* **2021**, *13*, 2834. <https://doi.org/10.3390/su13052834>

Academic Editor:
Quan-Hoang Vuong

Received: 29 December 2020
Accepted: 26 February 2021
Published: 5 March 2021

Publisher's Note: MDPI stays neutral with regard to jurisdictional claims in published maps and institutional affiliations.



Copyright: © 2021 by the authors. Licensee MDPI, Basel, Switzerland. This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution (CC BY) license (<https://creativecommons.org/licenses/by/4.0/>).

1. Introduction

Substance misuse remains an ongoing health crisis affecting every region of the world, increasing the burden of disease globally [1]. Across the globe, approximately 250 million people use addictive substances every year of which 63.5 million have a substance use disorder (SUD) [2]. Despite substance use disorder mitigation efforts [3], relapse rates remain high at 40–60% [3], with mortality from drug and alcohol use disorders at 6.9 deaths per 100,000 globally [4]. Harm minimization approaches appear to hold promise for those with a history of addiction or dependence not wishing to obtain abstinence [5,6]. Harm reduction approaches that support people with a poor prognosis for abstinence-based treatment would make for sustainable needle and syringe program (NSP) practices [5]. Sustainable NSPs are human-centered, cost-effective, socially embedded, aligned to the health policies of jurisdictions [6], and offered at sufficient intensity to achieve program goals and population outcomes in the long-term [7].

While, harm reduction approaches to substance use dependency and addiction are increasingly being adopted, a paucity of research exists pertaining to the sustainability of their implementation protocols across service types [8]. More specifically, emerging

evidence as to the sustainable implementation qualities of NSPs is yet to be aggregated. As such, we aimed to scope the evidence for implementation qualities of sustainable harm reduction NSPs. Such evidence would inform NSP services for those with a history of addiction or dependence for which abstinence would be less successful.

1.1. Harm Reduction Approaches: Sustainable Implementation Considerations

In the context of drug treatment policy, harm reduction refers to minimizing the health, social and economic costs of drug use to both individuals with addiction or dependency and the communities in which they participate [9]. Early adopters of harm reduction approaches included Australia, Canada, Portugal, Switzerland, the United Kingdom, and The Netherlands, and have since spread through Asia, Latin America, and Central Eastern Europe [10]. The sustainability of harm reduction policies and programs would greatly depend on their implementation design, responsiveness, and resourcing, alongside financial longevity, social acceptance, and accessibility. We aim to review the evidence on implementation design, responsiveness, and resourcing of harm reduction focused NSP.

Needle and syringe programs are low threshold services for people who inject drugs characterized by few to no access obstacles [11]. They comprise of primary, secondary, mobile and outreach services, syringe vending machines and pharmacies that sell or provide injecting equipment free of charge, predominately run within publicly funded health services [12]. The primary goal of an NSP is the distribution of sufficient injecting equipment, supported by educational interventions to reduce or eliminate the reuse of injecting equipment among people who inject drugs (PWID) [13]. Needle and syringe programs are proven to reduce the risks of blood borne virus transmission through the provision of sterile injecting equipment to people who inject drugs (PWID) [14] and come at comparatively lower cost than alternative approaches [15]. Despite their relative cost-effectiveness, NSP implementation is largely shaped by a country or regions philosophical approach to drug treatment [16], often with little research evidence on implementation guidelines. Furthermore, while NSPs continue to operate funded through public health agencies, political, media or community campaigns mean they remain vulnerable to closure in the absence of the evidence for their sustainability [13].

1.2. Health Policy Frameworks

Health policy frameworks provide the context for implementation of programs aimed at aligning a country's priorities with its populations health needs, in partnership with government, health and development partners, civil society and the private sector for improved use of available resources [17]. Consensus building across multiple stakeholders in health policy framing slows the implementation of NSPs, given the politics of drug policy and stigmatization of people who inject drugs [18]. Moreover, policy framing and planning that occurs at all levels of a countries health care system can support sustainable NSP implementation due to increased public buy in [19]. Partners in sustainable NSP implementation would commit, if they perceived evidence of quality, affordability, acceptability, and accessibility [6]. We aim to apply a theory driven framework to aggregate the emerging research evidence on NSP program implementation qualities with PWID using the Consolidated Framework for Implementation Research (CFIR) [20].

1.3. Implementation Study Framework

The CFIR defines five implementation determinants: (1) individuals involved in service delivery (e.g., their knowledge and beliefs about the intervention), (2) the internal organization setting (e.g., leadership engagement), (3) the implementation processes (e.g., executing the innovation), (4) the program/intervention characteristics (e.g., complexity, accessibility, quality, affordability and acceptability) and (5) the external setting (client needs and resources). We expect sustainable NSPs would be designed to these qualities, yet the evidence is unclear as to how the interactions among these determinants would influence implementation outcomes. For instance, trust building among potential service

users would be influenced by implementation processes, particularly given that social stigma has been linked to the mis-trust of health services experienced by people who inject drugs (PWID) [13]. Similarly, the context of service provision by organizational, geographical, political, and cultural factors would influence the resourcing of NSPs [21], while acceptability of NSP services is dependent upon how much they are trusted by prospective adopters [13]. For those with a substance use disorder, social stigma is behind the mistrust of health services and therefore detracts from service engagement [13].

Legalization of NSPs increased their visibility which in some contexts, resulted in client arrests [22]. Noted as a structural barrier to the sustainability of an NSP is police arrest and prosecution activity. Arrest or prosecution of NSP clients when accessing a legal NSP undermines the trust PWID have in the inclusiveness of public health laws [23] and compounds the risk of unsafe drug injecting [22] while also deterring NSP service uptake. This in turn places PWID at a greater risk of blood borne virus transmission and overdose [23]. User-oriented NSP implementation can reduce stigma as it is mutually understood that PWID may not require assistance beyond the provision of clean injecting equipment and associated paraphernalia (tourniquets, alcohol wipes and so forth) [13]. There is no expectation from staff that PWID will require, nor want assistance for their drug use [13].

1.4. Goal of the Review

We aimed to conduct an exploratory scoping systematic review [24,25] to identify both gaps and trends in literature, clarifying definitions, and report practices that can inform future research and practice. A scoping systematic review is appropriate for summarizing the emerging evidence on sustainable NSP health interventions.

Objectives

This scoping review aims to map evidence for the sustainability of NSPs defined by the CFIR framework of implementation determinants inclusive of; program implementers and internal setting, implementation process and characteristics, and external factors. Our specific research question was: What is the emerging evidence pertaining to sustainable NSP implementation qualities including implementers, internal setting, implementation process and characteristics, and external factors?

Findings would be important for the sustainability of NSPs framed on implementation qualities evidence in harm reduction studies considering the perspective of those who are most directly affected by their operation. Moreover, the evidence would inform future studies on NSP implementation, providing benchmarks for evaluation and improvement at both an individual, program, and systems level.

2. Materials and Methods

2.1. Search Strategy for Identification of Studies

We searched the Cochrane Database of Systematic Reviews for previous reviews on the sustainable implementation of NSPs and yielded a null result, which justifies this systematic scoping review. We then searched electronic databases including PubMed, ProQuest Central and the Directory of Open Access Journals for peer-reviewed studies pertaining to NSP implementation, restricting our search to the period 2000 to 2020. Our selection of databases prioritized studies that described implementation protocols at a sufficient level of detail to allow for determination of their relevance to the study aims. Moreover, we searched field specific journals inclusive of *Substance Use and Misuse*, *Addiction*, *Aids and Behaviour*, *Harm Reduction Journal* and *The International Journal of Drug Policy* for relevant studies. We searched each database and journal using a combination of search terms inclusive of needle and syringe program implementation, implementation science, addiction, and NSPs (see Table 1).

Table 1. Overview of search procedure key topics, terms and criteria.

Topic	Key Words/Phrases Searched	CFIR Criteria
Needle and syringe program/Syringe (exchange program implementation)	Needle and syringe program, AND implementation, AND people who inject drugs, OR implementation science, addiction, dependence OR sustainable needle and syringe, program characteristics, AND community, health policy, accessibility, feasibility, affordability, cost evaluation.	(1) Service delivery (e.g., their knowledge and beliefs about the intervention), (2) Internal organization setting (e.g., leadership engagement), (3) Implementation processes (e.g., executing the innovation), (4) Program/intervention characteristics (e.g., complexity, accessibility, quality, affordability and acceptability)
Needle and Syringe program/Syringe protocols.	Harm minimization, OR harm reduction, dependency, addiction, substance use disorder, AND individual characteristics, long-term, adherence, fidelity, AND regulations, providers, sites.	(5) the external setting (client needs and resources).

2.1.1. Eligibility Criteria

We included for review empirical studies that (a) were published in English, and (b) had an explicit focus on harm minimization needle and syringe program implementation. To be eligible, studies were (i) case studies, cross-sectional, or longitudinal studies, (ii) on a clearly identified study population, (iii) with description of their specific harm reduction/NSP implementation procedure or protocol and (iv) with information on sustainability characteristics of user involvement in design accessibility, affordability, and feasibility. In doing so, we prioritized studies that included a process and/or outcome evaluation of the harm reduction/NSP implementation protocol by users and/or providers as well as how program characteristics aligned with health care policy. We excluded studies that were in languages other than English and did not describe the harm reduction/NSP implementation protocol they used in a manner that enabled determination of their sustainability. See Table 2 for variable inclusion and exclusion criteria.

Table 2. Study variable inclusion and exclusion criteria.

Variable	Inclusion Criteria	Exclusion Criteria
Study Design	Empirical studies.	Literature reviews and studies that were not peer-reviewed.
Publication Years	2000—present.	Published prior to the year 2000.
Participants	People who inject drugs, needle and syringe service providers and related stakeholders inclusive of community members, policymakers, and police.	Participants who could not be identified as either a needle and syringe program implementer, member of an NSP internal setting or external setting.
Intervention	Needle and syringe program/syringe exchange program implementation and evaluation.	Other harm reduction programs inclusive of; opioid substitution treatments and medically supervised injecting centers/drug consumption rooms.
Process	Description of implementation protocol, process evaluation procedure.	Missing details on implementation protocol.
Outcomes	Sustainable needle and syringe program implementation characteristics relating to implementers, inner setting, implementation process, intervention characteristics or outer setting.	Sustainable implementation characteristics not relating to the implementation of needle and syringe programs.

2.1.2. Search Tree Procedure and Outcomes

We retrieved a total of 722 articles for screening (see Figure 1), and screened the articles by titles and abstracts, excluding a total of 652 at this stage. Our selection process yielded a preliminary list of 70 articles for further scrutiny against inclusion criteria, excluding 42 that did not meet the inclusion criteria. The first and second listed authors then accessed the full text of the 28 articles, applying the pre-determined eligibility criteria. We excluded 23 articles at this stage leaving five articles. To optimize our search yield, we browsed the reference lists of each of the articles that met the inclusion criteria for any additional articles of relevance. From this manual search, we found an additional study, resulting in six articles for this study. Final study inclusion was by consensus between the first two listed authors, moderated by the third listed author as needed.

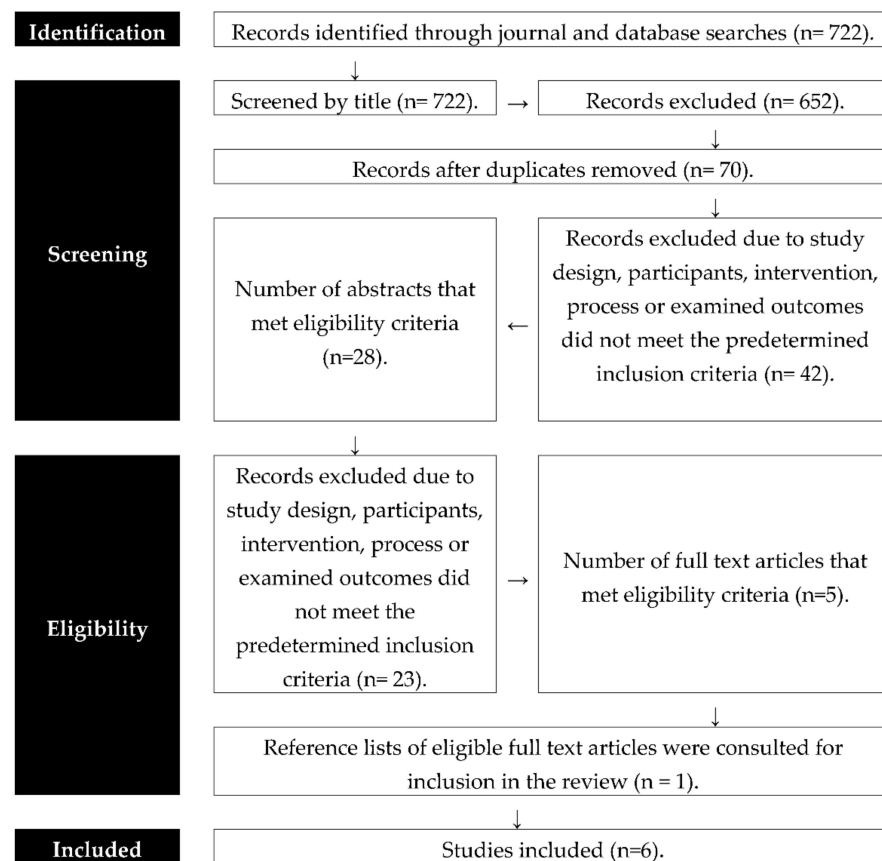


Figure 1. Search strategy.

2.2. Data Extraction and Management

For the data capture and organization relevant to the research aim, we utilized a modified version of Arksey and O'Malley [24] data extraction tool. This tool organizes according to the following categories: (1) author/year, (2) study design, (3) methods and recruitment, (4) description of study objectives, and (5) outcomes or findings [24]. Our modification was to include an implementation protocol description and evaluation. This method modification allowed for data mapping identifying both implementation approach and NSP outcomes. Table 3 presents the studies included from our search procedure.

Table 3. Studies included in the review.

Authorship	Study Design and Objectives	Participants and Context	Sustainability of Implementation Qualities		
			Implementers and Inner Setting	Implementation Process and Characteristics	External Setting
[18]	In-depth qualitative interviews examining the historical, social, political, and scientific contexts for the implementation of publicly funded NSPs.	Key stakeholders (policy makers, community stakeholders and advocates) from three US cities; Baltimore, Philadelphia, and Washington.	Sustainable Needle and Syringe program implementation is supported by an implementation willingness of policy makers based on community sentiment.	Community implementation models top down versus community activist impact program sustainability.	Empirical research evidence has a fear and concern mitigating role in driving policy change for the sustainable implementation of NSPs.
[26]	Electronic Survey to assess community pharmacists' willingness to participate in one harm reduction initiative: syringe/needle exchange.	Kentucky community pharmacists with active licenses ($n = 827$) for NSP services.	Pharmacists were willing to provide NSP services although fewer were willing to dispose of needles/syringes. Agreement with the public health impact of NSPs impacted pharmacist's willingness for service provision.	Barriers to the sustainable implementation of an NSP were reported to include clientele, ethics surrounding supply of materials for abuse or illegitimate use, company policy conflict, legal concerns, record keeping, time, reputation, supply problems and finding/handling needles.	None identified.
[27]	Qualitative study to assesses barriers and effectiveness of NSP's, effectiveness and barriers across Vietnam.	Key informant interviews ($n = 23$), focus group discussions ($n = 6-8$ participants per group) Peer Educators (8 groups) IDU's (5 groups) Local residents (7 groups), in-depth interviews ($n = 8$).	Peer Educator led NSP would be more sustainable with higher literacy and retention with NSP programs.	Sterile water ampules were not provided at NSPs due to concerns from implementing partners. Trust building would therefore contribute to sustainable NSP implementation that fosters adequate equipment provision.	Implementation sustainability is improved with law enforcement support and intensive advocacy with community stakeholders, local government, mass organizations and local residents.
[28]	Face-to-face survey to examine community-level support for a newly implemented ADM in an inner-city Sydney area known for high levels of drug use.	Local area residents ($n = 118$) and businesses ($n = 35$) located within the vicinity of needle and syringe program (NSP) services including the ADM.	Business entities showed greater support for fixed-site NSPs in general comparatively to those situated locally.	Offering extended hours for NSP via ADM would be cost effective. Anonymity for clients may increase sterile injecting equipment use.	Community member support would be important for the sustainability of NSPs.
[29]	Qualitative (interviews) to identify factors and conditions that facilitated or deterred the adoption of NSPs.	Key informants ($n = 17$) from nine U.S. cities.	Program leadership a key facilitator to sustainable implementation of NSPs. and when leaders with access to local power and resources.	NSP program processes that (a) respectful of political and cultural norm sensitivities, and (b) prioritized coalition building and community involvement, would be sustainable.	NSPs would be more successful aligned to community values and public policy.

2.3. Data Analysis and Synthesis

We summarized findings from the studies using narrative qualitative synthesis [30]. This data synthesis approach allowed for identifying NSP implementation determinants framed on the CRFI according to implementers and their inner setting, the implementation process, and its characteristics (e.g., quality, complexity, affordability, accessibility, and acceptability) and community based external factors.

3. Results and Discussion

Findings from our scoping review indicate the importance of implementer qualities (willingness and beliefs), implementation process factors (inclusion of PWID), program intervention characteristics (accessibility and acceptability) and external factors (policy, community acceptance and policing) for improved NSP sustainability. Above all, the evidence suggests sustainable harm reduction NSPs require support from multiple stakeholders, given the multifaceted requirements of their implementation [31], and interactions among each of the implementation determinants. The specific findings of each are discussed below.

3.1. Implementers and Internal Setting Factors of Sustainable NSPs

Implementer willingness and self-efficacy or beliefs about NSP feasibility would enhance sustainability [18], as would leadership resourcing [26,29]. For instance, pharmacists who agreed with the public health impact of NSPs were more likely to provide clean needles and syringes to PWID and dispose of used needles and syringes within the pharmacy [26]. Kentucky community pharmacists expressed 3.56 times more willingness to provide clean needles. However, the perceived barriers to selling needles and syringes without a prescription differed between Kentucky independent and chain/supermarket pharmacists with independent pharmacists reporting workflow barriers contrary to chain/supermarket pharmacists who reported clientele safety concerns as a barrier to selling needles and syringes without a prescription.

Local business support for NSPs influenced implementation feasibility in that they might show token support for NSPs at fixed sites as opposed to widespread automatic dispensing machines (ADM) [28]. Automatic dispensing machines are a sustainable and inexpensive method of increasing needle and syringe distribution to PWID. In Australia, although general support for harm reduction programs was high among survey business leaders, their awareness of such services operating in the immediate vicinity was less so. For instance, significantly lower proportions of businesses indicated awareness of fixed-site NSPs generally (63% vs. 83%, $p = 0.01$), the existence of pharmacy NSP (29% vs. 50%, $p = 0.03$) and an ADM (31% vs. 53%) ($p = 0.03$) in the local area comparatively to residents [28].

Peer implementers of NSPs with high literacy demonstrate service provision aligned to community sentiment and are more likely to remain engaged with NSP service provision than those less literate. As such, supporting improved literacy and employment retention could benefit the sustainability of peer led NSPs [27], suggesting both an education and internal program function.

3.2. Sustainable Implementation Process and Characteristics

NSP implementation process and characteristics of (a) community coalitions, (b) community activists or (c) bottom-up approaches enhanced NSP sustainability [18], as did implementers flexibility to adopt emerging empirically based interventions [28]. This could be explained by the fact that grassroots based approaches have user buy-in, and flexible hours are a well-known low threshold service access quality. Evidence-based practices are important for legitimizing NSPs [29]. For instance, Strike, Watson, Lavigne, Hopkins, Shore, Young, Leonard and Millson [15] reported implementation success of the Ontario Needle Exchange Best Practice that followed evidence-based needle and syringe recommendations, including distribution of sterile water ampoules and safer

inhalation equipment. NSP processes that (a) are respectful of political and cultural norm sensitivities, and (b) prioritized coalition building and community involvement, would be more sustainable than those lacking in these qualities [29]. Greater community support for NSPs would enhance sustainability of implementation [18], so too would long-term financial commitment [8] minimizing risk for rapid depletion of the pool of available resources [29].

3.3. Sustainable NSP External Setting Characteristics

The study by Ngo, Schmich, Higgs and Fischer [27] conducted in Northern Vietnam found community support was a critical component of NSP implementation. A finding consistent with that of Downing, Riess, Vernon, Mulia, Hollinquest, McKnight, Jarlais and Edlin [29] whereby coalition building, and community consultation were deemed critical steps required for acceptability and sustainability of NSPs. To obtain community support required intensive advocacy with community stakeholders including local government, mass organizations, local residents, PWID and their families with the acquisition of law enforcement officials [27]. As an example, White, Haber and Day [28] reported on community attitudes to harm reduction and automatic dispensing machines (ADMs) in Sydney, Australia. ADMs are a sustainable and inexpensive method of increasing needle and syringe distribution to people who inject drugs. They reported local community opposition to ADMs despite national Australian data indicating support for harm reduction. Respondents to the study had concerns about possible increases in drug related crime. However, the majority of business leader participants were in support for NSP services in general (fixed-site NSPs (83%), pharmacy NSP (82%), and to a lesser extent, ADMs (67%)). Conversely, local businesses' support was slightly lower (fixed-site NSPs (77%); pharmacy NSP (80%), ADMs (60%)) [28].

External NSP setting characteristics such as partnerships between health, law enforcement, PWID, clinicians, researchers and government officials are essential for sustainable NSP implementation [8]. Furthermore, Downing, Riess, Vernon, Mulia, Hollinquest, McKnight, Jarlais and Edlin [29] suggest community NSP support is highest in places where HIV transmission presentation is a predominant community concern.

3.4. Implementation Determinants Interaction Factors

Implementer and internal setting factors at the policy level would influence the sustainable implementation of NSPs. For instance, Clark [32] suggests that drug treatment policies are influenced by national or regional prerogatives, perhaps more so than documented evidence for NSP programs. Yet, while the provision of research evidence does not guarantee policy change, it is a necessary step for sustainable implementation [18]. Moreover, policymakers may have varying opinions on the merits and moral obligations of expanding services to meet the needs of PWID [18]. Such merit and moral obligations result in policymakers struggling to implement evidence-based policies while simultaneously addressing electorate priorities [18].

Allen, Ruiz and O'Rourke [18] examined the role of research evidence in policy change processes for the sustainable implementation of publicly funded syringe exchange services in three US cities: Baltimore, MD, Philadelphia, PA, and Washington, DC. Results indicated sustainable implementation of NSPs in Baltimore and Philadelphia were dependent on research evidence application to secure policy change, conversely policy change discussions in DC were influenced by community and stakeholder fears and concerns that NSPs would increase both substance use related crime and the number of discarded syringes found in public locations. White, Haber and Day [28], also reported perceived increases in drug related crime and drug use a barrier to sustainable implementation, despite there being no empirical evidence to support such perceptions [8].

3.5. Implications for NSP Implementation Sustainability Research and Practice

In efforts to confront the health disparities among an estimated 15.9 million people who inject drugs globally [33] NSPs have been implemented. However, sustainable access to such services is not equal across the globe, with low and middle-income countries implementing NSPs at coverage levels below that required to stabilize and reverse HIV epidemics among PWID [18]. Commonly cited implementation barriers included funding, senior management, and decision-making. The primary weakness of government-initiated implementation models includes bureaucratic systems and susceptibility to pressure from community criticism creating an inability to respond quickly or flexibly change [29]. Our findings suggest that empirically based best practice recommendations are implemented successfully within NSPs when available. Additionally, community consultation at the design stage of protocol implementation, improves community acceptance.

Needle and syringe program's sustainability is dependent upon both their accessibility and continued utilization among the population base they aim to serve [34]. The World Health Organization [35] recommends NSPs distribute 200+ needles per PWID annually for their sustainable use [35]. However, substantial variability in NSP service provision, utilization, coverage, range, needle and syringe distribution and program reach are obstacles to their sustainable implementation [14]. Moreover, provider, structural, and societal barriers to NSP access for PWID [36], alongside communities lack of knowledge surrounding NSP objectives, policies, laws, regulations, locations and stigma hinder their sustainable implementation [34].

A longstanding societal value to prevent drug misuse rather than safer use of a person's substance of choice continues to run counter to NSP implementation [14]. This is despite NSPs being a proven health intervention for reducing the transmission of blood borne viruses among PWID [37]. For NSPs to be sustainable, they need to be feasible within the intended context [31]. Essential for improved health outcomes of PWID is mutual trust and communication with NSP providers. Vuong, et al. [38] suggest that when service providers are perceived not to have a genuine interest in a client's views an asymmetrical relationship presents placing the client in a vulnerable position. Furthermore, medical distrust results in reduced service engagement [38] which in turn affects its sustainability.

3.6. Limitations of the Applicability of Evidence

Few of the studies provided descriptions of their implementation protocols, and even fewer reported on their implementation process evaluation. This limited our ability to map the implementation protocols for sustainability qualities. We synthesized the data applying the CRFI framework, which is not exhaustive. Other studies may find a different profile from using alternative criteria. Furthermore, with very few studies that met our inclusion criteria, we could not determine the influence of publication bias, the tendency for statistically significant positive results to be published in greater proportions than those of statistically significant negative or null results [39]. An included study reported an attempted contact with opponents of NSPs that was not successful. As such, the perspectives of those prospective participants were not captured in the study results [29]. Furthermore, while we were able to capture results from studies conducted in Australia, Canada, the USA and Vietnam paucity of available literature addressing implementation qualities of sustainable NSPs impacts the scope of comparison between countries. Additionally, not all countries with a harm reduction drug treatment policy were represented in the findings further justifying the need to aggregate sustainable implementation qualities as they emerge.

4. Conclusions

We found evidence to suggest the importance of implementer resourcing, engagement, and willingness on the design and implementation of sustainable NSPs. Such factors would veritably translate across diverse implementer communities inclusive of program managers, peer educators, pharmacists, and NSP providers. Sustainable implementation

process factors aim to build ownership and trust of NSPs, as measured by relevance and accessibility to PWID. External factors such as NSP user-friendly law-enforcement, community support and cost-containment improve NSP sustainability. Overall, there is more literature evaluating specific areas of policy or practice, comparatively to NSP provider engagement and consumer responsive sustainable implementation. Similarly, the mapped evidence trends toward implementer process characteristics and external policy frameworks. Such findings could guide both new and existing NSP provision, evaluation, and adaptation to be more consumer responsive.

Author Contributions: D.R., conceptualized the study, wrote the initial draft, completed the data curation and implemented the methodology; D.R. and E.M., carried out the formal analysis of data; E.M., the project's primary supervisor, guided the research, writing—review and editing; R.R., the project's auxiliary supervisor, provided further review and ongoing writing review. All authors have read and agreed to the published version of the manuscript.

Funding: This research received no external funding.

Institutional Review Board Statement: Not applicable.

Informed Consent Statement: Not applicable.

Data Availability Statement: Not applicable.

Acknowledgments: The article is work in partial fulfillment of a PhD thesis within the Faculty of Medicine and Health, Rehabilitation Counseling Discipline at the University of Sydney.

Conflicts of Interest: The authors declare no conflict of interest.

References

1. Peacock, A.; Leung, J.; Larney, S.; Colledge, S.; Hickman, M.; Rehm, J.; Giovino, G.A.; West, R.; Hall, W.; Griffiths, P.; et al. Global statistics on alcohol, tobacco and illicit drug use: 2017 status report. *Addiction* **2018**, *113*, 1905–1926. [[CrossRef](#)] [[PubMed](#)]
2. United Nations Office on Drugs and Crime. *World Drug Report 2016*; United Nations: New York, NY, USA, 2016; ISBN 978-92-1-148286-7.
3. Brandon, T.H.; Vidrine, J.I.; Litvin, E.B. Relapse and Relapse Prevention. *Annu. Rev. Clin. Psychol.* **2007**, *3*, 257–284. [[CrossRef](#)] [[PubMed](#)]
4. Tran, B.X.; Moir, M.; Latkin, C.A.; Hall, B.J.; Nguyen, C.T.; Ha, G.H.; Nguyen, N.B.; Ho, C.S.H.; Ho, R.C.M. Global research mapping of substance use disorder and treatment 1971–2017: Implications for priority setting. *Subst. Abuse. Treat. Prev. Policy* **2019**, *14*, 1–14. [[CrossRef](#)] [[PubMed](#)]
5. Watts, J.; MacDaniels, B.; Rivera, S.; Resiak, D.; Mpofo, E.; Redwine, S. *Community Substance Use Safety*; Mpofo, E., Ed.; Palgrave/Macmillan: New York, NY, USA, 2020.
6. *Toward Sustainable Transitions in Healthcare Systems*; Routledge: London, UK, 2017.
7. Shelton, R.C.; Cooper, B.R.; Stirman, S.W. The sustainability of evidence-based interventions and practices in public health and health care. *Annu. Rev. Public Health* **2018**, *39*, 55–76. [[CrossRef](#)]
8. Wodak, A.; McLeod, L. The role of harm reduction in controlling HIV among injecting drug users. *AIDS* **2008**, *22*, S81. [[CrossRef](#)] [[PubMed](#)]
9. Rhodes, T.; Hedrich, D. Harm reduction and the mainstream. In *Harm Reduction: Evidence, Impacts and Challenges*; Rhodes, T., Hedrich, D., Eds.; MONOGRAPHS: Lisbon, Portugal, 2010.
10. Ritter, A.; Cameron, J. A review of the efficacy and effectiveness of harm reduction strategies for alcohol, tobacco and illicit drugs. *Drug Alcohol Rev.* **2006**, *25*, 611–624. [[CrossRef](#)]
11. Edland-Gryt, M.; Skatvedt, A.H. Thresholds in a low-threshold setting: An empirical study of barriers in a centre for people with drug problems and mental health disorders. *Int. J. Drug Policy* **2012**, *24*, 257–264. [[CrossRef](#)]
12. Kwon, A.J.; Anderson, C.J.; Kerr, J.C.; Thein, M.H.-H.; Zhang, G.L.; Iversen, P.J.; Dore, P.G.; Kaldor, P.J.; Law, P.M.; Maher, P.L.; et al. Estimating the cost-effectiveness of needle-syringe programs in Australia. *AIDS* **2012**, *26*, 2201–2210. [[CrossRef](#)] [[PubMed](#)]
13. Treloar, C.; Rance, J.; Yates, K.; Mao, L. Trust and people who inject drugs: The perspectives of clients and staff of Needle Syringe Programs. *Int. J. Drug Policy* **2016**, *27*, 138–145. [[CrossRef](#)] [[PubMed](#)]
14. Somlai, A.M.; Kelly, J.A.; Otto-Salaj, L.; Nelson, D. “Lifepoint”: A case study in using social science community identification data to guide the implementation of a needle exchange program. *AIDS Educ. Prev.* **1999**, *11*, 187.
15. Strike, C.; Watson, T.M.; Lavigne, P.; Hopkins, S.; Shore, R.; Young, D.; Leonard, L.; Millson, P. Guidelines for better harm reduction: Evaluating implementation of best practice recommendations for needle and syringe programs (NSPs). *Int. J. Drug Policy* **2010**, *22*, 34–40. [[CrossRef](#)]

16. Resiak, D.; Mpofu, E.; Athanasou, J. Drug Treatment Policy in the Criminal Justice System: A Scoping Literature Review. *Am. J. Crim. Justice* **2016**, *41*, 3–13. [CrossRef]
17. World Health Organisation. National Health Policies, Strategies and Plans. Available online: <http://www.who.int/nationalpolicies/about/en/> (accessed on 27 February 2017).
18. Allen, S.T.; Ruiz, M.S.; O'Rourke, A. The evidence does not speak for itself: The role of research evidence in shaping policy change for the implementation of publicly funded syringe exchange programs in three US cities. *Int. J. Drug Policy* **2015**, *26*, 688–695. [CrossRef]
19. World Health Organisation. National Health Policies, Strategies, and Plans: From Vision to Operation. Available online: <http://www.who.int/nationalpolicies/processes/operational/en/> (accessed on 27 February 2017).
20. Wallace, B.; van Roode, T.; Pagan, F.; Phillips, P.; Wagner, H.; Calder, S.; Aasen, J.; Pauly, B.; Hore, D. What is needed for implementing drug checking services in the context of the overdose crisis? A qualitative study to explore perspectives of potential service users. *Harm Reduct. J.* **2020**, *17*, 29. [CrossRef] [PubMed]
21. Demiris, G.; Parker Oliver, D.; Capurro, D.; Wittenberg-Lyles, E. Implementation science: Implications for intervention research in hospice and palliative care. *Gerontologist* **2014**, *54*, 163–171. [CrossRef] [PubMed]
22. Bluthenthal, R.N.; Heinzerling, K.G.; Anderson, R.; Flynn, N.M.; Kral, A.H. Approval of Syringe Exchange Programs in California: Results From a Local Approach to HIV Prevention. *Am. J. Public Health* **2008**, *98*, 278–283. [CrossRef]
23. Silverman, B.; Davis, C.S.; Graff, J.; Bhatti, U.; Santos, M.; Beletsky, L. Harmonizing disease prevention and police practice in the implementation of HIV prevention programs: Up-stream strategies from Wilmington, Delaware. *Harm Reduct. J.* **2012**, *9*, 17. [CrossRef]
24. Arksey, H.; O'Malley, L. Scoping studies: Towards a methodological framework. *Int. J. Soc. Res. Methodol.* **2005**, *8*, 19–32. [CrossRef]
25. Peters, M.D.; Godfrey, C.M.; Khalil, H.; McInerney, P.; Parker, D.; Soares, C.B. Guidance for conducting systematic scoping reviews. *Int. J. Evid. Based Healthc.* **2015**, *13*, 141–146. [CrossRef]
26. Goodin, A.; Fallin-Bennett, A.; Green, T.; Freeman, P.R. Pharmacists' role in harm reduction: A survey assessment of Kentucky community pharmacists' willingness to participate in syringe/needle exchange. *Harm Reduct. J.* **2018**, *15*, 4. [CrossRef] [PubMed]
27. Ngo, A.D.; Schmich, L.; Higgs, P.; Fischer, A. Qualitative evaluation of a peer-based needle syringe programme in Vietnam. *Int. J. Drug Policy* **2007**, *20*, 179–182. [CrossRef] [PubMed]
28. White, B.; Haber, P.S.; Day, C.A. Community attitudes towards harm reduction services and a newly established needle and syringe automatic dispensing machine in an inner-city area of Sydney, Australia. *Int. J. Drug Policy* **2015**, *27*, 121–126. [CrossRef]
29. Downing, M.; Riess, T.H.; Vernon, K.; Mulia, N.; Hollinquest, M.; McKnight, C.; Jarlais, D.C.D.; Edlin, B.R. What's Community Got to Do with It? Implementation Models of Syringe Exchange Programs. *AIDS Educ. Prev.* **2005**, *17*, 68–78. [CrossRef] [PubMed]
30. Saso, S.; Panesar, S.S.; Siow, W.; Athanasiou, T. Systematic Review and Meta-analysis in Clinical Practice. In *Evidence Synthesis in Healthcare: A Practical Handbook for Clinicians*; Darzi, A., Athanasiou, T., Eds.; Springer: London, UK, 2011; pp. 67–113.
31. Louie, E.; Barrett, E.L.; Baillie, A.; Haber, P.; Morley, K.C. Implementation of evidence-based practice for alcohol and substance use disorders: Protocol for systematic review. *Syst. Rev.* **2020**, *9*, 25–26. [CrossRef] [PubMed]
32. Clark, F. Global drug policy fuels hepatitis C epidemic, report warns. *Lancet* **2013**, *381*, 1891. [CrossRef]
33. Mathers, B.M.; Degenhardt, L.; Phillips, B.; Wiessing, L.; Hickman, M.; Strathdee, S.A.; Wodak, A.; Panda, S.; Tyndall, M.; Toufik, A.; et al. Global epidemiology of injecting drug use and HIV among people who inject drugs: A systematic review. *Lancet* **2008**, *372*, 1733–1745. [CrossRef]
34. Naserirad, M.; Beulaygue, I.C. Accessibility of Needle and Syringe Programs and Injecting and Sharing Risk Behaviors in High Hepatitis C Virus Prevalence Settings. *Subst. Use Misuse* **2020**, *55*, 1–9. [CrossRef]
35. World Health Organization. *WHO, UNODC, UNAIDS Technical Guide for Countries to Set Targets for Universal Access to HIV Prevention, Treatment and Care for Injecting Drug Users—2012 Revision*; World Health Organization: Geneva, Switzerland, 2012.
36. Iversen, J.; Grebely, J.; Topp, L.; Wand, H.; Dore, G.; Maher, L. Uptake of hepatitis C treatment among people who inject drugs attending Needle and Syringe Programs in Australia, 1999–2011. *J. Viral Hepat.* **2014**, *21*, 198–207. [CrossRef] [PubMed]
37. Aspinall, E.J.; Nambiar, D.; Goldberg, D.J.; Hickman, M.; Weir, A.; Van Velzen, E.; Palmateer, N.; Doyle, J.S.; Hellard, M.E.; Hutchinson, S.J. Are needle and syringe programmes associated with a reduction in HIV transmission among people who inject drugs: A systematic review and meta-analysis. *Int. J. Epidemiol.* **2014**, *43*, 235–248. [CrossRef] [PubMed]
38. Vuong, Q.-H.; Ho, T.-M.; Nguyen, H.-K.; Vuong, T.-T. Healthcare consumers' sensitivity to costs: A reflection on behavioural economics from an emerging market. *Palgrave Commun.* **2018**, *4*, 1–10. [CrossRef]
39. Torgerson, C.J. Publication Bias: The achilles' heel of systematic reviews? *Br. J. Educ. Stud.* **2006**, *54*, 89–102. [CrossRef]