

Prison Health is Community Health: The Indiana Peer Education Program

Andrea D. Janota

Indiana Peer Education Program – Project ECHO (IUPUI)

Patrick F. Hibbard (✉ patrickh@oslc.org)

Oregon Social Learning Center

Meghan E. Meadows

Indiana University – Purdue University Indianapolis

John P. Cocco

Indiana Federal Community Defenders

Abigail L. Carr

Step-Up, Inc.

Deborah Nichols

Indiana State Department of Health

Erika Chapman

Indiana State Department of Health

Gerardo Maupomé

Richard M. Fairbanks School of Public Health (IUPUI)

Joan Duwve

Kansas Department of Health and Environment

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Abstract

Background: Concerning health inequities have been found in incarcerated populations, which likely impact broader community health. This paper evaluates the Indiana Peer Education Program (INPEP ECHO), an initiative that aims to improve health knowledge using the Project ECHO (Extension for Community Healthcare Outcomes) model to train people incarcerated in Indiana prisons (USA) as peer health educators inside prisons. Peer educators undergo a 40-hour training and then facilitate 10-hour long health education workshops inside their facilities over several days.

Methods: We assessed the changes observed in pre- and post-session survey responses to estimate the impact this program had on peer educators and those they teach via multivariate regression analysis. We also examined peer educator qualitative data for emergent themes and confirmation of survey findings.

Results: Findings from the 10-hour workshops showed improved knowledge scores and post-release behavior intentions. Peer educator surveys indicated increases in knowledge, health attitudes, and self-efficacy scores. Qualitative analysis affirms the latter finding and points toward peer educators acquiring expertise in the content they teach and how to teach it and that positive results likely expand beyond participants to others in prison, their families, and the communities to which they return. Further, peer educators shared they felt new purpose and hope tied to their participation in INPEP ECHO. Although these survey results show positive change in the short term, such improvements have been shown in other research to lead to improved middle- and long-term outcomes.

Conclusions: Though preliminary, results indicate this type of public health intervention, training incarcerated individuals as peer educators on health topics, appears to increase important health knowledge and behavior intentions, which will likely lead to improvements in personal and public health outcomes. Results also point toward specific improvements associated with peers providing the education, and not external sources. The skills participants attain, as well, seem to increase their sense of purpose and self-efficacy, which have been shown to precede desistance from crime. While more work is necessary, the high costs associated with treating diseases like hepatitis C point toward an urgent need for programs like INPEP.

Introduction

Despite the constitutional duty of governments to protect the health of those incarcerated under their authority (1, 2), incarcerated populations experience higher rates of chronic disease and less desirable health outcomes overall (3, 4). Several factors influence this phenomenon. In the United States, social determinants associated with poor health – “being non-white, low-income, undereducated, homeless, and uninsured” (5, p2) – align with determinants of criminal legal system involvement (3, 4). Some scholars cite an “Epidemic of Incarceration,” in which communities generally underserved by the medical community are also recipients of the most punitive criminal policies, compounding structural issues that lead to even worse health outcomes, thereby supporting the idea that these concepts intertwine (6).

The literature lists relative disparities in incarcerated populations for chronic diseases such as hypertension, asthma, and cancer (7); infectious diseases like tuberculosis (8, 9), HIV (10), and hepatitis C (HCV) (11); and psycho-social issues including substance use and mental health issues (7). The SARS CoV-2 (COVID-19) pandemic has highlighted these disparities with disturbing rates of transmission within correctional facilities, including among prison officials and guards (12).

One approach to addressing these disparities seeks to improve health education for incarcerated populations (13, 14). Concurrently, researchers and practitioners have designed peer-led educational models for prisons (15, 16). The New Mexico Peer Education Project (NMPEP ECHO) combined these strategies, training people incarcerated in prison as health educators (17). Peer education is a method of teaching and exploring health information, values, and behaviors that taps into individuals' shared lived experiences to foster trust and establish credibility and acceptance (15). The NMPEP ECHO program was shown to improve health knowledge, attitudes, and behavior intentions, as well as increase self-efficacy for peer educators.

The Indiana Peer Education Program (INPEP ECHO) was launched in four of Indiana's seventeen state prisons in 2019, including two medium security, one mixed medium/maximum, and one maximum security facility. INPEP ECHO was the first replication of the NMPEP ECHO in the United States. INPEP ECHO facilitators teach peer educators, who are incarcerated at participating prisons, health education content and pedagogical practices through 40-hour trainings. Once graduated, peer educators conduct 10-hour workshops over several days among their peers, educating on a range of health topics. Though INPEP ECHO staff perform monthly site visits ensuring fidelity of workshops, peer educators themselves perform all ongoing tasks associated with the program's implementation inside facilities.

Peer educators from all participating state prisons join monthly virtual "teleECHO" or continuing education sessions to share best practices and develop problem-solving skills. These sessions take their format from the Expansion for Community Health Outcomes (ECHO) model (18) which develops a "community of practice" where the peer educators engage in an exchange of ideas using a case-based learning model. Case presentations address challenges that arise inside facilities. Through these discussions, peer educators share ideas, give feedback, provide recommendations, and learn how to approach similar hurdles within their own facility. TeleECHOs are a source of new and relevant information that peers can use to bring back to their students and, at times, prison staff (e.g., medical or correctional personnel) (17). INPEP ECHO was developed to address the need for accurate health knowledge in Indiana prisons.

This study examines survey and qualitative data to test INPEP efficacy during the first year of the program. Though these amount to short-term, first-year outcomes, similar results have been associated with mid- and long-term outcomes in other settings (19, 20). Health knowledge, behavior intentions, and attitudes around health topics allude to health outcomes like disease transmission, preventive health involvement, and treatment adherence (e.g., voluntary vaccination). Self-efficacy and serving as a peer

educator may also point toward other outcomes like criminal desistance and long-term quality of life (21).

Proximate analysis like the current study can be further contextualized through complimentary/convergent methods. This may be attained through a combination of quantitative and qualitative tools. Toward this end, we employ several quantitative models, with increasing fixed-effects strictures, as well as explore qualitative data for confirming evidence.

Finally, INPEP ECHO incorporates layered, interlocking outputs and outcomes that might make full analysis difficult. The program serves two sets of individuals: peer educators and students. While expectations for the latter group generally amount to improved health knowledge and behavior, peer educators participate in a deeper way, with more sophisticated potential outcomes like empowerment and leadership qualities.

Data used in this study were collected for quality assurance and pedagogical purposes and were de-identified prior to any analysis. Thus, it fell outside of human subject research review by an institutional review board (IRB), as was verified by the Indiana University IRB prior to analysis.

Methods

Participants

The current study evaluates data obtained from 62 peer educators and 857 students. Though more people have participated, the research team excluded observations with missing data issues to ensure quality. All participants were incarcerated in the Indiana Department of Correction. Peer educators received a 40-hour training education on healthcare knowledge and pedagogical practices. Following graduation from the 40-hour component, participants held regular 10-hour workshops teaching healthcare topics with the general population at their facility. All methods were carried out in accordance with relevant guidelines and regulations.

Data

This study examines both quantitative and qualitative data. Quantitative data come from surveys peer educators and students take before and after trainings (see Appendix A for the instrument). Qualitative data comes from prison-system email responses peer educators provided to INPEP ECHO staff geared toward quality improvement.

Quantitative Analysis

Independent Variable

The primary independent variable for examining survey scores is whether the scores come from a post-training survey, as opposed to pre-

Dependent Variables

Our outcomes of interest come from survey scores. Surveys used replicate those used by NMPEP ECHO. Peer educator surveys contain four categories:

- *Knowledge*: 20 multiple-choice knowledge questions (with one correct answer out of four to five choices) about infectious diseases like HCV, sexually transmitted infections (STIs), substance use disorder, harm reduction, and noncommunicable conditions (e.g., how HCV is spread, how to prevent diabetes)
- *Attitudes*: five attitude questions using a five-point Likert scale (strongly agree to strongly disagree) to assess attitudes about issues like drug use, HCV and syringe services
- *Behavioral intention*: five behavioral intention questions using a five-point Likert scale (very likely to very unlikely) to assess the likelihood that peer educators, upon release, would: find a primary health care provider, use condoms every time they have sex, get a tattoo using shared ink or equipment, talk to their sex partner(s) about sexually transmitted infections (STIs) and consistently wash their hands before meals and after using the bathroom
- *Self-efficacy*: Seven self-efficacy questions using a five-point Likert scale (strongly agree to strongly disagree) to assess ability to teach, retain necessary information and overall confidence in their skills to be a peer educator

Student surveys include 10 knowledge and five behavioral intentions questions.

Control Variables

Surveys, for both peer educators and students, include questions about race, ethnicity, age, and education level. As a prison facility only houses a specific sex,^[1] this characteristic folds into the covariate for facility. These are included as covariates in most cases, though specifications that include individual-level fixed effects do not allow for these (creating multicollinearity).

Qualitative Analysis

Our primary source of data for qualitative analysis comes from email responses by peer educators to questions about their experience with INPEP ECHO performance, which staff developed internally toward quality improvement. Since the COVID-19 pandemic severely limited contact between INPEP ECHO staff and peer educators, the Indiana Department of Correction allowed staff to communicate with peer educators using the prison email available to people incarcerated via their personal tablets. During these communications, peer educators were asked about their views on the INPEP ECHO program, what it means for them personally, and what it means for others (both inside prisons and the broader community). Specifically, peer educators were asked:

- Can you tell me your general opinion of INPEP ECHO? What would you say are our successes?
- Do you think there has been any impact on your facility generally?

- How about with people specifically (like yourself)?
- Are there any skills you have gained from being a part of the INPEP ECHO team?
- What challenges or barriers have you faced as a peer educator?
- Do you have any suggestions for us to do better?
- Is there anything you would like to share that isn't covered in these questions?

Three coders evaluated independently de-identified data from 21 peer educators, then met to discuss their findings and general themes and attain consensus for themes identified.

Empirical Strategy

Quantitative Analysis To examine survey outcomes, we used a multivariate regression model that included incrementally more strict fixed effects. As survey results skewed heavily to the right (higher scores), we monotonically transformed outcome data using a natural log. The independent variable of interest, that a survey score was for the post-session instrument, was a binary variable, so a log transformation of the outcome variable also made interpretation easier.

We clustered standard errors at the facility level to deal with any spillover effect between participants at the same facility (which would violate a core regression assumption: stable unit treatment values) (24). Further, we present models below that include graduating fixed effects as a test for robustness. Since the sample of peer educators is much smaller than students, we cannot use the date of assessment as a fixed effect in the same model as the variable as this would introduce multicollinearity. Thus, we present two models for peer educators that include facility fixed effects and all control variables and another with facility and individual fixed effects (excluding individual control variables, which would also create multicollinearity). We present four models for students that show graduating levels of fixed effects. Stata statistical software was used for all quantitative analysis (StataCorp, College Station, TX).

Qualitative Analysis

We performed theme analysis of qualitative data, using a synthesis of phenomenological and grounded theory approaches, looking for common constructions of peer educator experiences (25). The process involves approaching analysis agnostically, without preconceived notions, letting the data dictate theory development. Two of the three authors who reviewed the qualitative data have operational connections with INPEP ECHO, so a third was engaged to examine the data with little preliminary knowledge of the program. Our reasoning to follow this approach stems from two premises. (1) The reality experienced by peer educators may be much different from researchers' ideas about that reality. Any overlapping themes provide an accurate account of the experienced INPEP ECHO phenomenon. (2) Crediting peer educators with constructing this reality continues the explicit goal of the program to empower participants.

Sample Characteristics

As of March 2021, INPEP ECHO operated in four Indiana prisons. The program has trained 64 peer educators, who have taught approximately 2,000 students. Not all were included in analysis to ensure data integrity – observations with missing data issues were excluded, especially those in which matching pre- and post-training survey responses could not be matched. Table 1 shows descriptive statistics for both peer educators and students included in this study. The peer educator group contains a higher proportion of Black/African American participants, representing the largest racial group for peers, relative to students. Peer educators also tended to be a bit older, though students had a wider range of ages. Note that the only facility housing females in this sample is the Indiana Women’s Prison, so this factor also accounts for participant sex.

TABLE 1 *Descriptive Statistics*

	<u>Peers</u>	<u>Students</u>
Age (Mean)	39.88 (range: 21-69)	37.03 (range: 18-72)
Race (Percent)		
Asian	0.00	0.47
Black	46.77	28.94
Native American	1.61	2.80
Pac Islander	0.00	0.47
Other/mult race	14.52	9.10
White	35.48	58.11
No Answer	1.61	0.00
Ethnicity (Percent)		
Hispanic	3.48	5.83
Facility (Percent)		
CIF	17.74	69.10
IWP	30.65	11.29
Pendleton	19.35	7.79
Plainfield	32.26	11.82

¹As prisons generally do not recognize the construction of gender (22,23), we discuss “sex” as the biological variable these institutions work from.

Results

Quantitative Analysis

Survey score averages are reported in Table 2, as well as the largest possible score. Student surveys did not include questions about self-efficacy or health attitudes. In all cases post-training survey scores come in higher than pre-

TABLE 2 *Outcome Statistics*

	<u>Peers</u>		<u>Students</u>	
	Pre	Post	Pre	Post
Knowledge Scores	11.52/20	15.40/20	4.65/10	6.58/10
Self-Efficacy	27.34/35	33.11/35	-	-
Behavior Intentions	24.02/25	24.32/25	21.54/25	22.66/25
Attitudes	23.66/25	24.99/25	-	-

Peer Educators

Table 3 reports results for peer educator surveys. Model (1) includes control variables and facility fixed effects. Model (2), on the other hand, includes both facility and individual fixed effects but no control variables, as they would introduce multicollinearity. We include the coefficients for the *Post* variable as well as percent change. Since the outcome variable is log transformed and *Post* is a binary indicator

variable, percent change = $e^{\beta_1} - 1$.

Results indicate no significant change for behavior intentions, but significant and robust improvements for knowledge score, self-efficacy, and attitudes. An interesting finding comes from the scores showing more improvement when individual-level fixed effects are in the model. Knowledge scores increase by 31.6%, attitudes by 10.4%, and self-efficacy by 24.6%.

TABLE 3 *Peer Scores*

		(1)	(2)
Knowledge Scores	Post Coefficient	0.217*	0.274***
		(0.0758)	(0.0269)
	Post Percent	24.12%	31.57%
	Within-R2	0.4108	0.6730
	N	62	62
Self-Efficacy	Post Coefficient	0.191*	0.222*
		(0.0773)	(0.0924)
	Post Percent	21.00%	24.63%
	Within-R2	0.1912	0.3184
	N	62	62
Behavior Intentions	Post Coefficient	0.012	0.008
		(0.0089)	(0.0187)
	Post Percent	1.29%	0.08%
	Within-R2	0.1636	0.0073
	N	62	62
Attitude	Post Coefficient	0.029	0.099**
		(0.0318)	(0.0164)
	Post Percent	2.94%	10.37%
	Within-R2	0.1461	0.1185
	N	62	62
	Control Variables	All	Limited
	Fixed Effects	Facility	Facility, ID Number

Standard Error in Parentheses

** p < 0.05, ** p < 0.01, *** p < 0.001*

Students

Table 4 lists results for student surveys. These indicate a modest increase in behavior intentions and a dramatic increase in knowledge scores. Further, results are robust to all specifications, including (4) which

includes individual identification number fixed effects. Students' behavior intentions improved by 6%, and their knowledge scores increased by almost 59%.

TABLE 4 *Student Scores*

		(1)	(2)	(3)	(4)
Knowledge Scores	Post Coefficient	0.4422** (0.0717)	0.4566*** (0.0051)	0.4620*** (0.0001)	0.4633*** (0.0733)
	Post Percent	55.62%	57.87%	58.73%	58.93%
	Within-R2	0.127	0.095	0.093	0.185
	N	857	857	857	857
Behavior Intentions	Post Coefficient	0.0550** (0.0058)	0.0700*** (0.0024)	0.0667*** (0.00003)	0.0583*** (0.0008)
	Post Percent	5.65%	7.25%	6.90%	6%
	Within-R2	0.058	0.056	0.053	0.050
	N	857	857	857	857
	Control Variables	All	All	All	Limited
	Fixed Effects	Facility	Facility, Date	Facility, Date, Facility x Date	Facility, Date, Facility x Date, ID number

Standard Error in Parentheses

** p < 0.05, ** p < 0.01, *** p < 0.001*

Qualitative Analysis

This quote concisely represents many of the themes discovered in the qualitative data: “[INPEP] ECHO is the hope in a hopeless generation... It shows compassion for the men and women incarcerated and being able to slow the process on the harms that go on. The teachings also build confidence, character, and a belief in oneself [and] facilitate the messages that help us gain knowledge in our lives” (Participant 13).

We can classify peer comments into two categories: personal and community impact. Table 5 lists some of the personal benefit themes and counts for their occurrence. 17 out of the 21 respondents mentioned improved health knowledge for themselves and the students they teach, with a strong possibility of future health benefits. “My general opinion of INPEP ECHO would be that it saves people’s lives. Whether it be with harm prevention tools we share [or] how important it is to get tested” (Participant 3).

Many functional skills were mentioned as personal benefits, with the most prominent being improved communication and public speaking. One person said, “I’ve never been able to talk without stuttering in front of people and I can do that now, also feeling I’m able to connect with people who need this information” (Participant 15). Other skills mentioned include teamwork, confidence, and leadership capabilities. Respondents also described improvements in less tangible beliefs, many felt a stronger sense of belonging: “... I am not just an inmate but play an important role in helping people...” (Participant 2). Over half of the peer educators discussed some type of larger perspective, gaining perspective outside themselves, as evidenced by mentions of empathy, altruism, or generativity. A good example comes from Participant 19 who said participation helped them to learn “to care about ourselves, and in turn caring about others.” Another representative quote: “INPEP [ECHO] has given me... the chance to make amends through serving and helping others” (Participant 16). Five respondents mentioned the word “hope”.

TABLE 5 *Qualitative: Personal Benefits*

Skills		Beliefs	
Health knowledge	17	Belonging	11
Communication	9	Empathy/Altruism	11
Teamwork	6	Hope	5
Confidence	7		
Leadership	4		

Another important theme that emerged from the data is self-efficacy. Not only do peer educators indicate an improved sense of self-efficacy, but many also tie this change to two potential mechanisms of action: having expertise in a specific topic (health knowledge) and feeling a sense of purpose and usefulness. One participant stated, “[INPEP ECHO] aids in building our self-worth... it adds to our skillset, it helps us and lends hope to the lost, forgotten, overlooked, and marginalized” (Participant 16). Another said, “You have taught me that I am not just an inmate but play an important role in helping people...” (Participant 3). Table 6 lists the number of respondents who used self-efficacy language, as well as how many were associated with new expertise and sense of purpose (four individuals mentioned both).

TABLE 6
Qualitative: Self-Efficacy & Broad Benefits

		<u>Broad Benefits</u>	
Self-Efficacy	12	Prison	8
➔ Expertise	8	Families	4
➔ Purpose	8	Communities	4

Table 6 also lists the number of participants who discussed INPEP ECHO benefits applying beyond participants. These peer educators believe activities benefit not only others in prison, but also their families and larger communities. Participant 12 provided a vignette about a conversation, “[they] told me that the [other parent] of [their] child had told [them] that [their] son was a type-one diabetic. Because of INPEP, I was able to answer questions that [they] had about [their] son’s condition.”

Discussion

Quantitative results indicate INPEP ECHO achieves the goals of increasing health knowledge, as well as other goals, with peer educators also showing significant increases in health attitudes and self-efficacy. Behavior intention scores, however, only showed improvement with students. Qualitative data confirm peer educator scores and provide new information about the impact INPEP ECHO has on participants, as well as others in prison and beyond.

Though originally designed to increase health knowledge in prisons, and thereby decrease the transmission of deadly diseases like hepatitis C, the model quickly adapted to early results to include more content toward increasing self-efficacy (17). Self-efficacy and serving as a peer educator may also point toward seemingly tangential outcomes like criminal desistance and long-term quality of life (21).

The variation in results for health behavior intentions between peer educators and their students proves interesting. Peer educators attend trainings facilitated by INPEP ECHO staff. Students, on the other hand, attend workshops led by their incarcerated peers. It may be that the latter group show improvement in this category, while the former does not, due to content delivery by people they view as equals. These results come from two different populations, though, so the possibility also exists that individuals volunteering to train as peer educators already exhibited healthy behaviors or were less likely to change such intentions.

Theoretical implications also arise from qualitative results. Participants described improved self-efficacy invariably as a companion to newly gained expertise in health topics and/or a new sense of purpose. As self-efficacy has been associated with desired outcomes for those experiencing incarceration (e.g., lower recidivism, higher quality of life; (21)), this finding points toward mechanisms of action to increase self-efficacy. Further work is needed, though, to explore how this pathway functions.

From a practical perspective, the costs associated with chronic disease – especially within incarcerated populations – present a case in which the break-even point for investing in programs like INPEP ECHO arises quickly. For instance, treatment for hepatitis C in people incarcerated costs facilities approximately \$15,000 to treat in early stages, or as high as \$42,000 if it progresses to liver cancer (26). Thus, increased health education that nudges people toward prevention or early treatment lowers costs by an average \$27,000 for each case. Avoiding an infection altogether provides savings somewhere between early- and late-stage treatment costs. Considering annual costs for INPEP ECHO run approximately \$162,000, it would take six people choosing early treatment or between four and 10 avoided cases to reach the break-

even point. We present conservative estimates here to illustrate how quickly returns come from investment.

Moreover, improving confidence and self-efficacy in this population offers its own desired outcome. Providing peer educators and their students with an opportunity to learn and grow builds hope. Given that negative outcomes (e.g., substance use relapse, recidivism) correlate with constructs like low self-efficacy, programs such as INPEP ECHO address underlying issues antecedent to such negative outcomes.

This evaluation highlights the benefits of further investment into programs like INPEP ECHO that involve peer education. Not only will money spent on peer education programs in correctional facilities avoid direct costs associated with chronic illness, but improvements in issues like confidence and self-efficacy will likely positively impact downstream outcomes. As returns on these investments likely come in so quickly, saturation – the point at which costs equal returns – will not likely be reached any time soon. Many costs are fixed, meaning that economies of scale can be obtained by expanding to this saturation point.

Findings also indicate the need for further research, as they largely represent intermediate outcomes. These short-term results point toward potential mid- and long-term improvements, as work in other contexts has demonstrated (13, 14). Health knowledge, behavior intentions, and attitudes around health topics may influence health outcomes like reduced disease transmission, preventative health involvement, and treatment adherence (e.g., voluntary vaccination). While immediate improvement in health knowledge may imply better health outcomes, objective examination of health and criminogenic outcomes is necessary to further strengthen the case. If such assumptions about objective outcomes prove correct – that future research shows lower rates of infection, higher treatment rates, or lower recidivism rates – then cost-benefit analysis becomes simple.

Limitations

As discussed above, this study serves as preliminary evidence of INPEP ECHO's efficacy. Survey responses and qualitative data provide intermediate measures we hope lead to improved objective outcomes. Because of this study's limitations, we are unable to draw definitive conclusions about long-term, objective outcomes. These instruments also provide INPEP ECHO-specific language (see Appendix A) and make generalizability difficult. Finally, all data were collected toward quality assurance and improvement efforts of an ongoing program. That is, instruments and data collection procedures were not designed with research in mind.

Conclusion

Programs like INPEP ECHO aim toward layered goals: improving health education, which hopefully leads to improved health outcomes, as well as increasing intangible qualities like confidence and self-efficacy, also with the hope of improved long-term outcomes. Further, these programs hope to leverage such outcomes in participants into more general, community-wide outcomes. This study shows improvements

in health knowledge, attitudes about health topics, behavior intentions, and self-efficacy, which offers early evidence that INPEP ECHO is achieving its goals. Qualitative data support quantitative results, lending weight to our overall conclusion. Given the costs associated with chronic disease and negative criminogenic outcomes (e.g., recidivism), investment into these programs likely offers substantial returns. Scaling these programs to serve more people in prison would likely increase savings, at an increasing rate (via economies of scale).

Findings add to previous literature evaluating NMPEP ECHO by applying robust quantitative methods and incorporating qualitative analysis as validation of quantitative findings, in addition to identifying emergent themes. The present study also adds to broader incarcerated peer education literature by providing additional evidence that health education training has general benefits.

Declarations

Ethical approval and consent to participate: All methods were carried out in accordance with relevant guidelines and regulations. The need for ethics approval as well as informed consent for this study was waived by the Indiana University institutional review board (IRB).

Consent for publication: Not applicable

Availability of data and materials: The datasets generated and/or analyzed during the current study are not publicly available due to privacy concerns but are available from the corresponding author on reasonable request. Stata code used for analysis is also available from the corresponding author on reasonable request.

Competing interest: The authors have no conflict of interest.

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References

1. Friedman MC. Cruel and Unusual Punishment in the Provision of Prison Medical Care: Challenging the Deliberate Indifference Standard. *Vanderbilt Law Review*. 1992;45:921–49.
2. Klein SB. Prisoners' Rights to Physical and Mental Health Care: A Modern Expansion of the Eighth. *Fordham Urban Law Journal*. 1978;1–33.
3. Ferguson WJ. Justice Involvement Has a Profound Link to Social Determinants of Health. *Commonwealth Medicine* [Internet]. 2018 Apr 19 [cited 2020 Oct 14]; Available from: <https://commed.umassmed.edu/blog/2018/04/19/justice-involvement-has-profound-link-social-determinants-health>
4. Sugarman OK, Bachhuber MA, Wennerstrom A, Bruno T, Springgate BF. Interventions for Incarcerated Adults with Opioid Use Disorder in the United States: A Systematic Review with a Focus on Social Determinants of Health. Genberg BL, editor. *PLoS ONE*. 2020 Jan 21;15(1):e0227968.
5. Macmadu A, Rich JD. Correctional Health Is Community Health. *Issues in Science and Technology*. 2014;32(1):64–70.
6. Dumont DM, Brockmann B, Dickman S, Alexander N, Rich JD. Public Health and the Epidemic of Incarceration. *Annu Rev Public Health*. 2012 Apr 21;33:325–39.
7. Binswanger IA, Redmond N, Steiner JF, Hicks LS. Health Disparities and the Criminal Justice System: An Agenda for Further Research and Action. *J Urban Health*. 2012 Feb;89(1):98–107.
8. Baussano I, Williams BG, Nunn P, Beggiato M, Fedeli U, Scano F. Tuberculosis Incidence in Prisons: A Systematic Review. Menzies D, editor. *PLoS Med*. 2010 Dec 21;7(12):e1000381.
9. MacNeil JR, Lobato MN, Moore M. An Unanswered Health Disparity: Tuberculosis Among Correctional Inmates, 1993 Through 2003. *Am J Public Health*. 2005 Oct;95(10):1800–5.
10. Freudenberg N. HIV in the Epicenter of the Epicenter: HIV and Drug Use Among Criminal Justice Populations in New York City, 1980–2007. *Substance Use & Misuse*. 2011 Jan 10;46(2–3):159–70.
11. Varan AK, Mercer DW, Stein MS, Spaulding AC. Hepatitis C Seroprevalence Among Prison Inmates Since 2001: Still High but Declining. *Public Health Rep*. 2014;129(2):187–95.
12. Kinner SA, Young JT, Snow K, Southalan L, Lopez-Acuña D, Ferreira-Borges C, et al. Prisons and Custodial Settings Are Part of a Comprehensive Response to Covid-19. *The Lancet Public Health*. 2020 Apr;5(4):e188–9.
13. Robertson AR, St. Lawrence J, Morse DT, Baird-Thomas C, Liew H, Gresham K. The Healthy Teen Girls Project: Comparison of Health Education and STD Risk Reduction Intervention for Incarcerated Adolescent Females. *Health Educ Behav*. 2011 Jun;38(3):241–50.
14. Watson R, Stimpson A, Hostick T. Prison Health Care: A Review of the Literature. *International Journal of Nursing Studies*. 2004 Feb;41(2):119–28.

15. Bagnall AM, South J, Hulme C, Woodall J, Vinall-Collier K, Raine G, et al. A Systematic Review of the Effectiveness and Cost-Effectiveness of Peer Education and Peer Support in Prisons. *BMC Public Health*. 2015 Dec;15(1):290.
16. Devilly GJ, Sorbello L, Eccleston L, Ward T. Prison-Based Peer-Education Schemes. *Aggression and Violent Behavior*. 2005 Jan;10(2):219–40.
17. Thornton K, Sedillo ML, Kalishman S, Page K, Arora S. The New Mexico Peer Education Project: Filling a Critical Gap in HCV Prison Education. *Journal of Health Care for the Poor and Underserved*. 2018;29(4):1544–57.
18. Zhou C, Crawford A, Serhal E, Kurdyak P, Sockalingam S. The Impact of Project ECHO on Participant and Patient Outcomes: A Systematic Review. *Acad Med*. 2016 Oct;91(10):1439–61.
19. Adams R. Improving Health Outcomes with Better Patient Understanding and Education. *RMHP*. 2010 Oct;61.
20. Blackstock F, Webster K. Disease-Specific Health Education for Copd: A Systematic Review of Changes in Health Outcomes. *Health Education Research*. 2006 Oct 23;22(5):703–17.
21. Johnston TM, Brezina T, Crank BR. Agency, Self-Efficacy, and Desistance from Crime: an Application of Social Cognitive Theory. *J Dev Life Course Criminology*. 2019 Mar;5(1):60–85.
22. Lee A. Trans Models in Prison: The Medicalization of Gender Identity and the Eighth Amendment Right to Sex Reassignment Surgery. *Harvard Women’s Law Journal*. 2008 Jan;31:447.
23. Rosenblum D. “Trapped” in Sing Sing: Transgendered Prisoners Caught in the Gender Binarism. *Michigan Journal of Gender & Law*. 2000;6(2):503–71.
24. Wing C, Simon K, Bello-Gomez RA. Designing Difference in Difference Studies: Best Practices for Public Health Policy Research. *Annual Review of Public Health*. 2018;39(1):453–69.
25. Creswell JW. *Qualitative Inquiry & Research Design: Choosing Among Five Approaches*. 2nd ed. Thousand Oaks: Sage Publications; 2007. 395 p.
26. Tan JA, Joseph TA, Saab S. Treating Hepatitis C in the Prison Population Is Cost-Saving. *Hepatology*. 2008;48(5):1387–95.

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