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SYSTEMATIC REVIEW

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Capacity-building strategies that support correctional and justice health professionals to provide best-evidenced based healthcare for people in prison: a systematic review

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Abstract

Background The United Nations (UN) 2015 'Mandela Rules' stipulates that people in prison will have access to equivalent healthcare to other community members. This expectation has challenged prisons in high-income countries to strengthen healthcare delivery to better meet the needs of the growing number of incarcerated First Nations and older, frailer people, many with complex healthcare needs. Yet little is known about correctional and justice health professionals' ('prison workforces') capacity to identify and support people in prisons with complex healthcare needs.

Aim To identify the post-Mandela Rules strategies that have increased the prison workforce's capacity to provide evidence-based healthcare.

Methods A systematic review. Three health and Criminal Justice databases were searched (2015-June 2024) to identify empirical data regarding the 'individual', 'organizational' and 'community' capacity-building strategies employed to improve the prison workforce's healthcare capabilities. Kirkpatrick's Model was used to assess the evaluation level, while Popay's narrative synthesis was applied to the extracted data. Findings are reported according to the PRISMA Statement.

Results Of the 20 included articles, the highest level of evidence (level III) was generated by a mixed methods study, with most ($n = 17$) generating low-level (Level IV) evidence. Ten studies evaluated mental health behavioral capacity-building strategies, with limited attention given to other chronic illnesses, ageing, palliative care, or cultural needs. More complex capacity-building strategies that included individual, organizational, and community-level elements generated the best outcomes. The best individual-level capacity-building outcomes were more frequent (> 5 occasions) interactive health-related education delivered in partnership with external experts. However, the commonly employed capacity-building strategies were short didactic education sessions, which were less effective.

Conclusion If prisons are to meet the UN Mandela Rules' aspirations, more impactful individual, organizational and community-level capacity-building strategies are urgently required. Transitioning to co-designed, interactive, culturally sensitive, evidence-based approaches is crucial if the prison workforce is to better recognize and effectively respond to the needs of more culturally diverse and older, sicker populations with complex healthcare needs.

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Background

The 2015 United Nations (UN) Standard Minimum Rules for the Treatment of Prisoners ('Mandela Rules') [1] are crucial for improving prison healthcare as they set internationally recognized standards for the humane treatment of people in prison. They emphasize that healthcare is a right and ought to be equivalent to that available in the community, including access to qualified health professionals, independent healthcare oversight, and protection from inhumane treatment or neglect [1]. They highlight the need for healthcare to be impartial, patient-centered and focused on rehabilitation rather than punishment [1]. When implemented the Mandela Rules ensure dignity and prevent the physical and mental health deterioration of people in prison, which is critical given this population's changing demographic and epidemiological profile [1].

Changing epidemiological profile of people in prison

In high-income countries, First Nations people, compared to non-First Nations people, are overrepresented in prison populations, including in Australia (2,701 vs 208 persons per 100,000) [2]; United States of America (763 vs 181 persons per 100,000)[3]; Canada (426 vs. 40 persons per 100 000, and New Zealand, where 50.9% of the prison population is Māori (528 per 100,000)[4], which is seven times higher than the general population [5].

A combination of poor social determinants of health, sedentary prison lifestyles, inadequate nutrition, and the psychological strain of incarceration, along with a higher prevalence of mental health and/or substance use disorders, contribute to earlier onset of comorbid illnesses for people in prison [6]. Due to the compounded effects of accelerated physiological ageing and its related challenges [7], people in prison are considered older at 50 or 45 years for First Nations people [8]. Increasingly, older people in prison experience disability, mobility issues, loss of independence, impaired cognition, and progressive life-limiting illnesses [9], which increase their vulnerability and need for timely healthcare, which is of considerable concern as the prison population is rapidly ageing due to historical convictions and longer sentences [10]. In Australia, between 2009 and 2018, the number of people in prison aged 45 and over rose by 79% from 5,300 to 9,600 individuals [11] and is currently 25% of the prison population [12]. The United States, 32.6% of people in prison are 46 years old and over [13], Canada has 26.1% a prison population of over 50 years [14], with UK 17% of people in prison are aged 50 years or older [15].

Security concerns, limited resources, and the need to manage chronic complex illnesses, substance use disorders, infectious diseases and the needs of an increasingly diverse and older population in a confined and highly regulated setting challenge the provision of optimal healthcare for people in prison [9]. In most countries, the challenge of delivering prison healthcare is compounded by the relative independence of correctional and justice health services and staff. Two distinct professional groups, correctional staff and justice health professionals, make up the prison workforce. Correctional staff (e.g., prison officers and administrators) are primarily responsible for safety, security, and the overall management of the prison environment. In contrast, justice health (e.g. doctors, nurses and allied health) professionals are responsible for providing clinical care that aligns with community healthcare standards [16, 17]. These distinct roles mean that correctional staff often lack the capabilities required to notice, escalate and effectively support people in prisons living with multiple comorbidities, declining health or to identify the cultural safety needs of First Nations people [18, 19]. This is despite the Mandela Rule's [1], and the UN Declaration on the Rights of Indigenous Peoples [20, 21] requiring the highest standard of health and well-being to be afforded to people in prison.

Given the rapidly changing demographic profile of people in prison due to historical crimes and longer sentences [10], understanding what capacity-building strategies have enabled the prison workforce to support a more culturally diverse and older, sicker and prison population is of growing global importance [18, 22].

Capacity-building

Capacity-building is integral to extending care to underserved populations, such as people in prison, as it assists with:

> *…the development of knowledge, skills, commitment, structures, systems, and leadership to enable effective health promotion [23] page 341.*

To be effective, capacity-building requires actions at three levels: "…1) the advancement of knowledge and skills among practitioners; 2) the expansion of support and infrastructure for health promotion in organizations; and 3) the development of partnerships for health in communities" [23] page 341. Yet, little is known about

the capacity-building strategies required to build the prison workforce's capacity to care for people in prison with complex and diverse healthcare needs.

Aim

To identify the strategies implemented since the introduction of the -Mandela Rules and their impact on the prison workforce's capacity to provide evidence-based healthcare to people in prison.

Method

Design: A systematic review reported according to the PRISMA Statement [24] and registered in PROSPERO (CRD42023410564).

Search strategy

Keywords and Medical Subject Headings (MeSH) were developed with support from a university librarian (Supplementary Material 2). A systematic search of relevant justice and health-related electronic databases, including ProQuest Criminal Justice, Web of Science and CINAHL was completed in June 2024.

The reference lists of all included articles were manually searched to obtain other pertinent articles.

Eligibility criteria

Eligible studies were those published in English, in peer-reviewed journals since the adoption of The Mandela Rules in 2015 [1] and reported empirical data measuring the impact of strategies designed to build the capacity of correctional and/or justice health professionals ($\geq$ 50% of the sample) to improve the health of adults in prison.

Study selection

Articles were downloaded into Covidence, and duplicates and non-primary articles were removed. Title and abstract screening was conducted by three reviewers (MH, CV and JLP) to eliminate ineligible studies [25]. One reviewer (MH) assessed all remaining for final inclusion, resolving disagreements through discussion with another reviewer (CV or JLP).

Risk of bias and quality

One author (MH) completed quality appraisal using the JBI Critical Appraisal Checklist for Quasi-Experimental Studies [26], confirmed by a second author (CV). Disagreements were resolved through discussion with the full authorship team.

Definitions

In this systematic review, the term"prison workforce"refers to the entire correctional workforce, including both correctional staff and justice health professionals. If a capacity-building strategy targets only one segment of the workforce, that specific group will be explicitly identified, such as"correctional staff"or"justice health professionals,"rather than both.

Data collection and analysis

A standardized table was used to capture: 1) details and results of included studies, 2) capacity-building strategies, and 3) Kirkpatrick Evaluation levels [27] (Table 1).

Capacity-building and evaluation

Identified capacity-building strategies were classified as targeting: 1) individual (i.e., correctional or justice health professionals), 2) infrastructure (i.e., changes to the prison environment), and/or 3) community-level actions (i.e. within or outside the prison) [23]. The evaluation of the capacity-building strategies was assessed using the Kirkpatrick Evaluation Model [27], as summarized below:

- Level 1 (Reaction) evaluates participants' perception of training relevance, engagement, and satisfaction.
- Level 2 (Learning) measures participants' knowledge, confidence, skills, attitude, and commitment acquired.
- Level 3 (Behavior) appraises participants'application of the learned concepts to their practice.
- Level 4 (Results) assesses the achievement of targeted outcomes post-training [49].

Narrative synthesis

A narrative synthesis was used to summarize and explain the study findings [50]. Preliminary synthesis identified patterns in the effects' direction, size and relationships between facilitators and barriers to successful capacity-building strategies. Differences between studies were examined to understand the intervention's impact on capacity-building. Validity assessment and critical appraisal ensured robustness of synthesis, providing insights into evidence-based approaches beneficial for building the prison workforce capacity to manage complex health needs [50].

Results

Of the 20 included studies (Fig. 1), most originated from the United States of America (USA) ($n = 12$) or Canada ($n = 3$)). Despite the high risk of bias (Supplementary Material 3), no studies were excluded as each offered valuable insights into capacity-building strategies for improving prison healthcare.

Table 1 Summary table

Reference (Country)	Aim	Design (Level of evidence)	Participants and sites	Capacity building classification	Kirkpatrick and Kirkpatrick [28] level outcomes and lessons learnt
[29] USA	Evaluation of a graduate evidence-based substance misuse treatment program	Quasi-experimental (pre-post-test) (Level IV)	Psychology graduate trainees ($n = 9$) at one rural women's prison	*Individual:* Structured experiential training composed of: weekly supervision and journal club for 6–12 months; and leadership development *Organization:* standardized early recovery treatment protocol; collaborated with correctional services to strengthen communication; and provided volunteer correctional environment training for psychology graduate trainees *Community:* University judicial system partnership, plus involvement of community health providers in the continuity of care following the person's release from prison release	*Level 1:* While, all participants completed the coursework and training competencies a small number ($n = 3$) were unable to facilitate the group work due to insufficient participation by people in prison due to frequent transfers of people in prison *Level 2:* Development of specific clinical competencies in cognitive behavioral therapy, acceptance and commitment therapy, and motivational interviewing *Lessons learnt:* • Need for flexible, self-contained modules that match the participant's needs • Flexible treatment protocol designed to accommodate frequent prison transfers
[30] USA	To understand correctional officers' perspective of Mental Health First Aid training	Qualitative study (focus groups) (Level VI)	Correctional officers (CO) ($n = 54$) at two prisons	*Individual:* Instructor-led Zoom sessions over three consecutive weeks (6.5 h). Blended format of self-paced e-learning and practical skills, interactive discussions and case-based learning	*Level 1:* Satisfaction with training and its relevance to correctional work. Training provided a safe space for correctional officers to discuss mental health issues *Level 2:* Increased understanding of mental health issues, improved attitudes, and confidence in applying the reported training *Lessons learnt*: • Need for a tailored, supportive, and stigma-free training environment with organizational support
[31] USA	Evaluation of a Hepatitis A and B program for people in prison	Quasi-experimental, pre-post-test study (Level VI)	Nurses ($n = 22$) and healthcare providers ($n = 4$) at one prison	*Individual:* one interactive 45-min face-to-face training session (slide presentation with 15-min Q&A) *Organizational:* Electronic Medical Records (EMR) standing Hepatitis A&B screening and vaccination order Designated vaccination nurse Establishment of a vaccination clinic *Community*: Collaboration and integration of EMR to local Immunization Information System	*Level 2:* Education session significant improvement nurses ($n = 9$) knowledge ($p = 0.04$) *Level 4*: Post-standing orders: Small reduction in screening from T1 to T2 (97.6% vs 96%), and implementation of standing order protocols. Automated clinical prompts modestly improved vaccination rates (0% to 2.4%). The introduction of monthly vaccination clinical and designated nurses increased vaccination rates (8.7%)

Table 1 (continued)

Reference (Country)	Aim	Design (Level of evidence)	Participants and sites	Capacity building classification	Kirkpatrick and Kirkpatrick [28] level outcomes and lessons learnt
					Limitations: Small convenience sample with only 41% of pretest data available. P and a post-test follow-up is conducted at the one-time point with only 50% of post-test data available. Capacity building strategy implemented during the COVID- 19 pandemic, resulting in decreased prison access and vaccine hesitancy among people in prison *Lessons learnt:* • Integrating technology with training can lead to better adherence. Structural changes can address workload challenges and are crucial to supporting staff in implementation • A multi-faceted approach is more likely to overcome barriers to implementation • Sustainability when integrated into routine healthcare delivery
[32] USA	Evaluation of the prison workforce's knowledge and preparedness to address suicide	Non-experimental mixed methods (Level IV)	All correctional staff, medical, mental health and administration ($n = 4,652$) in 22 prisons	*Individual:* Mandatory attendance 4 h, in-person biannual suicide training facilitated by mental health professionals. The video "Suicide is Forever" was screened, and all participants were required to pass a test upon completion Clinicians complete online training developed by contracted mental health provider *Organization:* Implementation of the three-level suicide rating scale	*Level 2*: Small increase in suicide warning sign knowledge and preparedness in people who viewed the video vs. those who didn't (80.7% vs. 79%) and (1.6% vs 76.6%) *Level 3:* Staff who participated in the suicide awareness training reported improved communication and enhanced suicide prevention skills *Lessons learnt*: • Biannual, mandatory training and awareness programs improve knowledge and preparedness
[33] USA	To evaluate the impact of an Extension for Community Healthcare Outcomes (ECHO) opioid use disorder treatment education program	Quasi-experimental (pre-post-test) (Level IV)	Pre- post- test survey ($N = 43$): Justice health ($n = 16$); Law enforcement ($n = 1$); Correctional services ($n = 12$); and other ($n = 14$) (Level IV)	*Individual:* 10 × 90-min bi-monthly Zoom didactic and case-based opioid misuse management learning sessions	*Level 1*: Poor attendance despite virtual learning environment. Only 5.3% ($n = 8$) of the registered participants ($n = 183$) attended all of the 10 sessions *Level 2*: Post-survey participants ($n = 43$) increased their opioid treatment disorder knowledge ($p = 0.013$) but no change in punishment ($p = 0.116$) or rehabilitation ($p = 0.194$) opioid use disorder knowledge *Lessons learnt*: • Need to incentivize and target recruitment • Further research is required to determine whether there were improvements in behavioral intention and practice changes

Table 1 (continued)

Reference (Country)	Aim	Design (Level of evidence)	Participants and sites	Capacity building classification	Kirkpatrick and Kirkpatrick [28] level outcomes and lessons learnt
[34] UK	Evaluation of trauma-informed training on the experience of people in prison	Post-test survey (Level IV)	Corrections Officers ($n = 113$) and recipients of their care: people in prison ($n = 116$) at two prisons (Level IV)	*Individual* 7-h structured and previously tested Trauma-Informed Services training developed by Covington [35]	*Level 3:* While the trauma-informed training improved correctional officers' perception of QoL, it did not improve the QoL of people in prison ($\bar{X}$3.45 vs. 2.69), per the 'Measuring the Quality of Prison Life' survey *Lessons learnt:* • The distal relationship between training and its direct impact on people in prisons' QoL or an insufficient intensity ('dose'), which only targets one aspect of QoL for people in prison, may have impacted the results
[36] USA	To evaluate the Enhancing Care of the Aging and Dying in Prisons (ECAD-P) program	Mixed methods pre-post-test evaluation (Level IV)	Justice Health RNs, doctors, psychological support staff & security personnel ($n = 241$) from six state prisons and a prison healthcare vendor	*Individual:* 6 × 2.5–4-h online modules An 80% cognitive test, with three attempts permitted before repeating the module	*Level 2:* The significant improvement in affective and cognitive changes ($p \leq 0.0001$) regarding care of the aged and dying suggests that the online learning modules offer a scalable delivery mechanism and a potential source of capacity building *Lessons learnt:* • Users who completed training in a single session during onboarding had poorer outcomes compared to those who spread training over time • Given the logistical and security constraints of prisons the training needs to be flexible and minimally disruptive. On-the-job training and overtime was a key factor in the successful implementation
[37] Scotland	To evaluate the feasibility of using'Living Life To The Full'(LLTTF) Cognitive Behavioral Therapy (CBT)-based self-help educational life skills for adult males serving long-term prison sentences	Quasi-experimental (pre-post-test) (Level IV)	People in prison ($n = 7$); and Correctional Officers ($n = 4$) At three prison sites	*Individual and organizational:* Post 3.5-h w/shop, correctional officers met individually with people in prison for four weekly 20-min sessions to implement the LLTTF CBT program and were provided access to clinical psychologist sessions 30 days post-training	*Level 4:* Significant improvement in people in prisons reporting of depression (PHQ- 9) ($p = 0.06$); but no improvement in their anxiety (GAD- 7) ($p = 0.31$); or functioning ($p = 0.5$) Qualitative feedback: *People in prison* were positive but desired more prison-specific content and fitness and sports opportunities *Correctional officers* found content patronizing and childlike; however, they improved their relationships with people in prison. No Correctional Officers (COs)

Table 1 (continued)

Reference (Country)	Aim	Design (Level of evidence)	Participants and sites	Capacity building classification	Kirkpatrick and Kirkpatrick [28] level outcomes and lessons learnt
					took up the post-training psychology support sessions Limitations: small sample size and no control *Lessons learnt:* • Protected delivery time, relief to cover usual duties, • Format changes: including more training/supervision, anonymous method of recruitment, including people in prison in training sessions, deliver awareness sessions about the CBT materials, • Invite participants to revise course content/materials
[38] Italy	To increase the vaccination of Hepatitis B Virus (HBV) in at-risk individuals in prison	Evaluation of the prison HBV strategy (Level IV)	Prison staff ($n = 150$); and Peer educators—People in Prison of different nationalities ($n = 138$) across 15 prisons	*Individual and Organizational*: Accredited CPD viral hepatitis course composed of 4 key strategies: 1) Didactic presentation – led by a physician 2) Q&A session next day 3) Peer education for people in prison and brochure dissemination 4) Cultural mediator inter-cultural approaches and skills to enable culturally sensitive education	*Level 4*: Significant improvement in HBV screening (91.3%, $N = 1177$, $p \leq 0.05$). Two-thirds of HBV at-risk people in prison 67% ($n = 730$) were given 1 st Anti-HBV vaccination (82.3%, $n = 601$, $p \leq 0.05$) *Lessons learnt:* • This improvement may be due to health and correctional staff training undertaken in separate groups • The use of cultural mediators helped build communication paths and ensured that topics were addressed through intercultural approaches and sensitivity, reaching a higher percentage of screening and vaccination
[39] USA	To evaluate the impact of Crisis Intervention Training (CIT) on correctional officers'knowledge, stigmatizing attitudes, and perception of available response options, its impact on the experiences of people in prison	Quasi-experimental, mixed-methods study (Level IV)	Correctional officers with CIT training ($n = 235$) versus Control ($n = 599$) Site ($n = 22$)	*Individual*: 40-h group training over five consecutive days	*Level 2:* The 5-day group CIT improved correctional officers'mental illness knowledge ($p = \leq 0.001$), stigmatizing attitudes ($p = \leq 0.001$), and preparedness to manage mental health crises ($p = \leq 0.001$) compared to the controls. Perceived desire to use force to de-escalate crises involving people in prison *Lesson learnt:* • The integration of CIT practices into institutional policies enabled COs to apply skills consistently and effectively in the prison environment • Cultural resistance of ingrained punitive culture a challenge to the broader acceptance of newly implemented strategies

Table 1 (continued)

Reference (Country)	Aim	Design (Level of evidence)	Participants and sites	Capacity building classification	Kirkpatrick and Kirkpatrick [28] level outcomes and lessons learnt
[40] USA	Evaluation of the impact of Crisis Intervention Team training and mental health referrals and use of force	Quasi-experimental, mixed-methods study (Level IV)	Correctional staff ($n = 308$)	*Individual:* 30 h didactic lectures; Simulation experience and 10 h of role play	Level 3: CIT training increased correctional staff mental health referrals ($p = < 0.001$) Level 4: CIT training techniques increased eventual compliance ($p = 0.038$) as did the proportion of staff that were trained in CIT ($p = 0.042$). However, it was not as effective in reducing the immediate use of force or achieving immediate compliance in all situations within correctional settings in training techniques ($p = 0.554$) or proportion of staff trained officers ($p = 0.21$) *Lessons learnt:* • Variability of application of skills learned and inconsistent impact suggest that the prison environment and organizational support play important role in application of capacity building strategies • The mixed results show potential of the training but there needs to be sustained evaluation and adaption of the program that matches the unique demands of prison setting
[41] Canada	To develop and test online mental health and addiction learning content	Sequential mixed methods study (Level IV)	Justice health nurses Delphi survey ($n = 25$) Pre-($n = 41$) vs. post ($n = 20$) intervention survey across three prisons	*Individual and organizational*: A Delphi survey was used to determine the CPD topic Sites selected their 30-min CPD webinar topics, which were delivered twice over 15 weeks at scheduled times to maximize attendance and relevance	*Level 1:* All sites attended the initial session, and 55% of nurses attended ≥ 1 webinar. Saved webinars were accessed 59 times. Participants expressed satisfaction with content and teaching materials, presentation style, delivery format, instructors, and ease of attendance, with a preference to attend in work time noted Barriers: Lack of access to online software, limited participation, workload, work schedule Facilitators: Flexible attendance options *Lessons learnt*: • Delphi's study—online learning is practical, but Q&A with instructors is essential • Scheduling flexibility and adequate staffing ensures participation in continuing education opportunities • Managerial support a critical factor for accessing continuing education

Table 1 (continued)

Reference (Country)	Aim	Design (Level of evidence)	Participants and sites	Capacity building classification	Kirkpatrick and Kirkpatrick [28] level outcomes and lessons learnt
[42] USA	To evaluate the impact of mental health training on correctional staff's understanding of trauma-informed care	Three-phase mixed-methods study: 1) needs assessment, 2) course development, and 3) pre-post test pilot (Level IV)	Correctional officers from 7 prisons with: 1) prior crisis intervention training (n = 29); or 2) without prior crisis intervention (N = 21)	*Individual*: 3-h training delivered by Justice Health clinician utilizing an open access suite of web-based learning content	*Level 1:* High satisfaction with content and delivery *Level 2:* Short courses can effectively increase correctional officers' knowledge of trauma-informed care (p = 0.046) when delivered by content experts (clinicians) who understand the operational environment *Lessons learnt:* • Stakeholders instrumental in shaping curriculum refining content to meet prison staffs needs • Training needs to incorporate realistic scenarios, case studies, and activities connected to real life situations • Gender and race/culture are influential factors in the receptivity of training in mental health and trauma
[43] Canada	Evaluate the effectiveness of the take-home naloxone program	Qualitative Study (Focus groups ×2 and one semi-structured interview) (Level IV)	Justice health staff (N = 9) ×2 prisons	*Individual, organization, and community:* Intervention: Train the Trainer Naloxone program, provision of home naloxone kit and harm reduction resources	*Level 1:* Lack of capacity, time and staffing are the main barriers to RNs implementing the train-the-trainer Naloxone program *Lessons learnt:* • Tailored approach to existing resources, population and processes necessary for implementation • Ongoing support and additional hands-on training sessions are needed to make sure health staff are prepared • Continuous education and training for COs and staff is recommended for a better understanding and support of initiatives • CO's directly involved in the program enhance programs reach and effectiveness and relieve the burden on healthcare staff • Improvements required: hands-on group and observation sessions; a step-by-step user guide; shorter video; a broader range of healthcare staff; collaboration with pre-trial centres; secondary advertisement within the prison; participants taught community access points; basic Naloxone Training for correctional officers; and naloxone stocked in the facility

Table 1 (continued)

Reference (Country)	Aim	Design (Level of evidence)	Participants and sites	Capacity building classification	Kirkpatrick and Kirkpatrick [28] level outcomes and lessons learnt
[44] UK	To assess the feasibility and acceptability of problem-solving training intervention for correctional staff to reduce the incidence of people in prison self-harming	Mixed methods (Level III- 3)	Prison staff: ($N=280$): Correctional officers ($n=120$), Clinicians ($n=78$); and Managers (n- 82) People in three prisons who had an episode of self-harm in the previous 2/52 ($n=48$)	*Individual:* 1-h staff training session in problem-solving skills delivered during lunch or induction	*Level 1:* Minimal program attrition from people in prison with only a few 2–4 engagements *Level 3:* Limited time and resources made translating knowledge into practice difficult for correctional officers, reducing the feasibility of the intervention *Level 4:* Incidence of people in prison ($n=48$) self-harming decreased by 18% (32 vs. 9) at three months (significance not reported) post-intervention *Lessons learnt;* • The co-design of training materials ensured that they were contextually relevant to the prison environment, fostered a sense of ownership, and increased the likelihood of the materials being well received • Need tailored, flexible, and sustainable approaches for capacity-building strategies in a prison environment • The importance of co-production, ongoing training, and considering the readiness of participants stressed in this study • Consideration of alternative implementation mechanisms crucial for successfully adopting new interventions
[45] France	Evaluation of collaboration between psychiatrist and pharmacist in benzodiazepine (BZP) in diazepam equivalent (DE) dose adjustment for people in prison	Retrospective medical record audit (Level IV)	People in prisons patient records ($n=1249$)	*Individual:* Pharmacy review of psychiatrists BZD prescribing before administration Monthly psychiatrist and pharmacist meetings over four years *Organizational:* Monthly meetings of both professions to review common guidelines *Community:* Collaboration between psychiatrists and pharmacists to promote health in prison setting	*Level 4:* Multidisciplinary teamwork had a positive impact on reducing BZD in people in prison using high doses (> 60 mg), although there was no significant effect in lower dose cohorts (30–60 mg) over five years *Lessons learnt*: • Collaboration, structured guidelines, ongoing education, and monitoring are important to achieve long-term outcomes • Effective collaboration via regular meetings and open communication between pharmacists and psychiatrists is crucial in developing and adhering to guidelines reducing overall BZD prescriptions • Sustained commitment over 15 years maintained lower dose levels over time

Table 1 (continued)

Reference (Country)	Aim	Design (Level of evidence)	Participants and sites	Capacity building classification	Kirkpatrick and Kirkpatrick [28] level outcomes and lessons learnt
[46] USA	To review the impact of national and local antimicrobial stewardship measures in 122 prisons	Quasi-experimental (pre-post-test) (Level IV)	Bureau of Prisons facilities ($n = 122$) with responsibility for 160,000 prisoners	*Individual and organization:* Two key strategies, 1) Local level—education and focused evaluations of prescriptions (i.e., academic detailing), conferences, webinars, daily meetings, and at least one clinical champion/prison 2) National level: Developing closed formulary, clinical practice guidelines, and antimicrobial stewardship	*Level 1:* The Antimicrobial Stewardship Program, led by an infectious disease physician with at least one champion, ensures the group stays focused and organized Level 2: Overall, AB was significantly reduced from 2010 to 2015 (7.64% vs. 5.84%) *Level 4:* Implementing a multi-disciplinary antimicrobial stewardship program decreased the total rate of antibiotic prescriptions in four prisons with a significant reduction ($p \leq 0.05$) *Lessons learnt:* • Multidisciplinary collaboration is essential • Ongoing education required to shift behavior toward evidence-based practices • Alignment of National and local efforts, e.g. guidelines and strategic plans
[47] Israel	To increase correctional officers' mental health knowledge and reduce stigmatization of people in prison	Single descriptive study (Level IV)	Correctional officers ($N = 83$) from various prisons[a]	*Individual and organization:* Six-day workshop with lectures, case reviews, general and panel discussions, peer supervision, simulations, and observational Training Two days of observational experience in a psychiatric ward	*Level 2:* Post workshop, increased correctional officers' knowledge ($p \leq 0.01$), reduced stigmatization ($p \leq 0.05$) and ability to manage interaction with persons with mental illness ($p \leq 0.05$) *Level 3:* Psychiatric nurses combine rich clinical experience and expertise in case management and group leadership skills to act as project designers, workshop instructors and group leaders/supervisors *Lessons learnt:* • Intervention successful due to role of expert led workshops who are crucial in designing and delivering workshop • continuous education, follow up training, and reinforcement of learned behaviors are required to maintain positive outcomes • Nurse led interventions can reduce stigmatizing attitudes

Table 1 (continued)

Reference (Country)	Aim	Design (Level of evidence)	Participants and sites	Capacity building classification	Kirkpatrick and Kirkpatrick [28] level outcomes and lessons learnt
[48] USA	Evaluate the effectiveness of the Memphis Crisis Intervention Team (CIT) training curriculum	Case series – pre and post-test & one-month post-survey (Level IV)	Correctional officers ($n = 100$) Law enforcement ($n = 179$) from prison services across nine counties[a]	*Individual and community:* 40-h voluntary experiential CIT training plus a tour of local mental health facilities	*Level 2:* Significant improvement post intervention ($n = 117$), in participants mental health knowledge ($p \leq 0.01$), Increased self-efficacy ($p \leq 0.001$); and perceived verbal de-escalation capabilities ($p \leq 0.001$) which was maintained at 30 days *Level 3:* Greater emphasis on active learning exercises (i.e., role-playing) instead of didactic lectures to maintain the positive post-test changes at 30 days *Lessons learnt:* • Active learning strategies like role play are effective in promoting practical application of the skills learned during training • officer characteristics such as race and rank influenced how officers applied the training, this suggests that different groups may require tailored approaches to maximize training effectiveness
[22] USA	To evaluate the impact of an aging program on the prison workforce's knowledge and care of older prisoners	Quasi-experimental (pre-post-test) (Level IV)	Correctional staff – security and justice health ($n = 49$) at ten prison facilities	*Individual:* 2-day didactic workshop	*Level 1: No* difference in pre and post-test scores, with 83.7% of correctional officers finding the Training (as per the 'Aging Inmates Training' survey) satisfactory and information useful *Level 2:* Training must be conducted regularly and frequently. The training content and evaluation measures must be better aligned *Lessons learnt:* • Incorporating feedback from corrections staff during planning stages ensures that the curriculum addressed their specific needs and challenges • Single training sessions are insufficient for deep, lasting change. Ongoing training is essential to reinforce concepts, introduce new information, and update staff on best practices for managing older people in prison • Given the varying backgrounds of corrections staff training programs should be adaptable to different levels of knowledge and professional focus. This may require developing different training modules for different groups within the staff • Involvement of experts from various fields enhances the training's depth and breadth, providing a well-rounded understanding of the issues surrounding aging inmates

BSF Beteende, Samtal, Forandring, *BSC* Behaviour Counselling, Change, *UPI* Usual Prison Planning interview, *MI* Motivational Interviewing, *RN* Registered Nurse, *CO* Correctional Officer, *STORM* Skills-Based Training on Risk Management, *REMS* Readiness Enhancement Management Strategies, *CIT* Crisis Intervention Team, *AB* antibiotic prescriptions, *HBV* Hepatitis B Virus, *LLTTF* Living Life To The Full, *ECAD-P* Enhancing Care of the Aging and Dying in Prisons, *QOL* Quality of Life, *ECHO* Extension for Community Healthcare Outcomes

[a] Number or statistics not reported

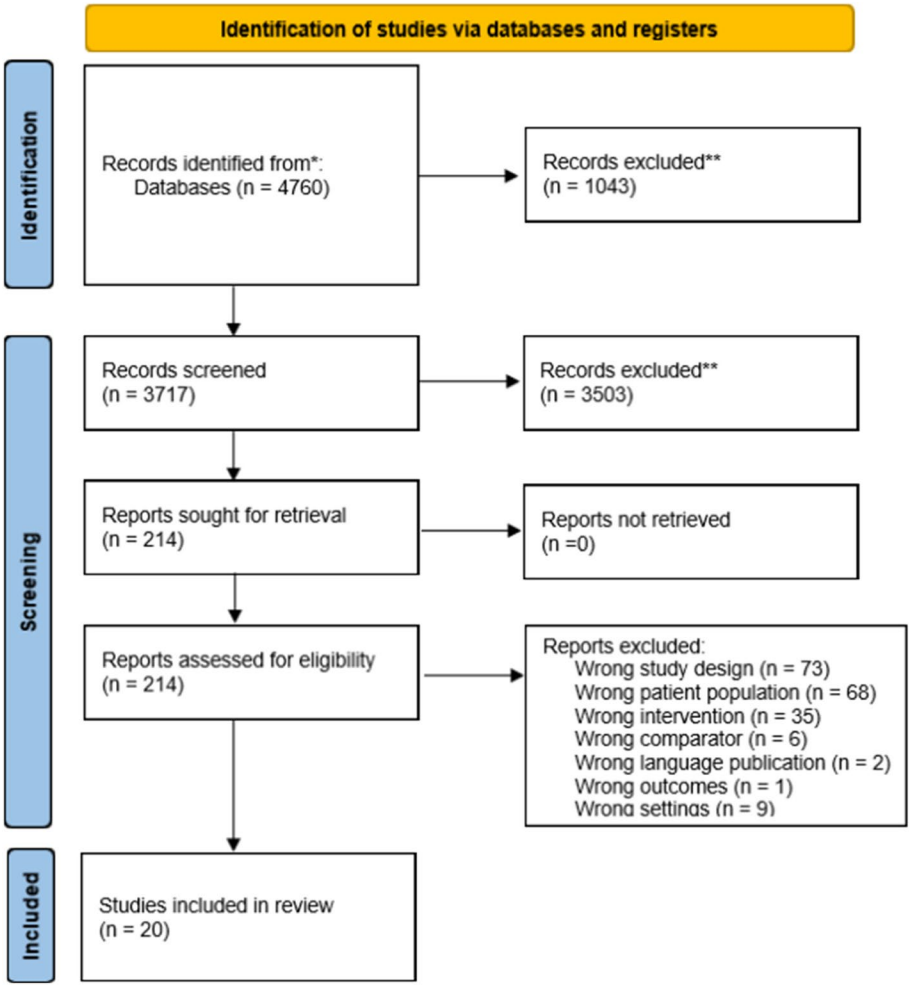

Fig. 1 PRISMA flow diagram

Evidence levels

Most studies (n = 17) generated lower-level IV evidence, except for a mixed-methods feasibility and acceptability study evaluating the implementation of Problem-Solving Training to reduce self-harm in prisons (Level III evidence)[44].

Capacity-building primary, secondary and tertiary healthcare focus

Two studies sought to build the prison workforce's (e.g. Justice Health and Correctional staffs) capacity to reduce the impact of Hepatitis A and infections through routine screening and vaccination [31, 38]. While most capacity-building strategies focused on the correctional staffs' role in reducing the impact of mental health events [30, 37, 40, 47, 48], a smaller number of strategies focused on the secondary prevention of opioid misuse disorder, hepatitis and suicide [32, 33, 38]. Antimicrobial stewardship was the only secondary prevention capacity-building strategy solely involving justice health clinicians [46]. Most interprofessional tertiary-level prevention capacity-building strategies sought to reduce the impact of various complex comorbidities, including mental health [34, 39, 41, 42, 44] or substance misuse disorders [29, 41, 43, 45]. Two studies focused on improving care for older people in prison [22, 36].

Level of evaluation

The evaluation of the capacity-building strategies varied widely, as summarized below (Table 2).

Kirkpatrick evaluation level 1

Two studies involving justice health clinicians assessing the training format, relevance and engagement [41, 43] reported that workload constraints impeded their participation [41, 43]. Leading Pearce, Mathany [43] to

Table 2 Summary of the capacity-building strategies by engagement occasions, capacity-building levels and strategies and evaluation levels

Study Author ($n = 20$)		Atem#	Auty	Freese	Lai	Pearce	Perry	DeHart	Flumo	Masters	Stasi	Adams	Canada	Davidson	Harwell	McNeeley	Almost	Cabelguenne	Falcon	Long	Melnikov
		Frequency of engagement Low/Unspecified ($n = 1$)						Frequency of engagement Moderate ($n = 2–4$)				Frequency of engagement High ($n = 5–10$)					Frequency of engagement Very High ($n = > 10$)				
Engagement Occasions		1	1	1	1	1	1	3	3	2	3	10	5	5	6	5	15	48	6–52	> 300	12
Capacity-building levels and strategies																					
Community		X				X					X							X	X		X
Organizational		X		X	X	X					X						X	X	X	X	
Individual		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Strategy	Participatory								X				X	X		X		X	X		X
	Case-based						X		X		X	X		X			X				X
	Professional support				X						X		X					X	X	X	X
	Multi-Modal																			X	X
	eLearn			X				X	X						X		X				
	Workshop		X		X																X
	Didactic	X		X		X	X	X		X	X	X				X	x		X	X	X
Kirkpatrick Evaluation Levels																					
Evaluation Level		4	3	3	4	1	4	2	2	2	4	2	2	3	2	4	1	4	3	4	3

recommend that correctional staff be included in all health-related interventions so they can be more successfully implemented.

Kirkpatrick level 2

Five of the six studies that measured knowledge and skill acquisition [22, 30, 33, 36, 39, 42] reported a higher level of knowledge attainment, which was attributed to tailoring the content to the unique operational and learning environments [30, 33, 36, 39, 42]. While short courses delivered by external content experts who understood the prison context increased correctional staff trauma-informed mental health knowledge ($p = 0.046$)[42].

Kirkpatrick level 3

Five studies evaluated skill application in the work environment [29, 32, 34, 47, 48]. A 17-month experiential training for psychology graduates ($n = 7$) enhanced prison-related skills, but frequent transfers hindered post-treatment outcome assessment [29]. Similarly, a trauma-informed workshop improved correctional staff's perception of the quality of life (QoL) for people in prison ($\bar{x}$ 3.45 vs. 2.69); however this strategy did not result in people in prisons reporting a better QoL [34].

Three studies evaluating strategies to enhance the mental health capabilities of corrections staff found that more intensive engagement yielded the best outcomes [32, 47, 48]. A six-day (48-h) experiential workshop delivered by psychiatric nurses improved correctional staff ($n = 83$) mental health knowledge ($p = < 0.01$), reduced stigmatization ($p = < 0.5$) and enhanced their interactions with people with mental illness ($p = < 0.05$) [47]. Similarly, a five-day (40-h) experiential workshop for correctional ($n = 100$) and law enforcement ($n = 179$) staff increased their mental health knowledge ($p = < 0.001$), self-efficacy ($p = < 0.001$), perceptions of verbal de-escalation ($p = < 0.001$), sustaining improvements 30-days post-training [48]. Qualitative prison workforce feedback on the mandatory biannual suicide prevention training provided in 22 USA prisons indicated that it enhanced their behavior and improved their ability to respond to people in prison's suicide risk [32].

Kirkpatrick level 4 (level 4)

Seven studies assessing the impact of capacity-building strategies reported variable results [31, 37, 38, 40, 44–46]. People in prison's depression improved ($p = 0.06$) after correctional staff completed a 3.5-h Cognitive Behavioral Therapy (CBT) workshop [37]. This improvement was attributed to adapting the learning content and materials (e.g., removal of illustrations and inclusion of permitted activities) to increase correctional staff's initial buy-in [37].

A combination of didactic lectures, peer education, and a cultural mediator inter-cultural approach delivered mixed success in increasing participation in a Hepatitis B virus screening and vaccination program across 15 Italian prisons [38]. This variance in success was attributed to different prison populations and resourcing [38]. While a 40-h Crisis Intervention Training (CIT) program combining didactic and experiential role-play successfully increased correctional staff mental health referrals and improved compliance, however it did not significantly reduce their use of force [40]. A short one-hour voluntary case-based didactic problem-solving training session for the prison workforce led to an 18% decrease in self-harm incidents involving people in prison three months post-training [44].

Few studies (n = 3) reached their desired training and support outcomes [31, 45, 46]. There was a 97.5% improvement in Hepatitis A and B vaccine status screenings, leading to an 8.7% increase in vaccination rates [31]. Though modest compared to the overall population, this outcome was adversely impacted by post-pandemic vaccine hesitancy [31]. A collaborative capacity-building strategy involving French psychiatrists and pharmacists over 15 years resulted in a 30% reduction in benzodiazepine-related issues for people in prison [45]. The implementation of multidisciplinary antimicrobial stewardship programs, closed formularies and clinical practice guidelines across 122 USA prisons effectively reduced antibiotic prescribing and increased the appropriate use of antimicrobials [46].

Capacity-building strategy levels

Singular and multi-level capacity-building strategies (i.e., individual, organizational, and/or community) and their intensity varied across the studies (Table 2). While resource constraints and institutional barriers influenced the frequency of capacity-building strategies, consistent or repeated strategies tended to lead to improved outcomes [22, 31, 32, 34, 38, 42–44].

Individual-level strategies

All studies implemented individual-level capacity-building strategies, and for half ($n = 10$), this was the only capacity-building strategy employed [30]. While the prison workforce preference is for experiential learning, 65% of the studies utilized a less effective didactic education format [22, 29, 30, 33, 40, 42–44, 47, 48].

Overall, the use of experiential learning capacity-building strategies delivered better outcomes. A fortnightly Opioid Use Disorder (OUD) Extension for Community

Healthcare Outcomes (ECHO) delivered via videoconferencing improved justice health clinicians knowledge ($p = 0.013$) over five months [33]. Experiential learning augmented with weekly supervision sessions, a journal club, and leadership development improved prison psychologists'CBT knowledge and skills, acceptance and commitment therapy, and motivational interviewing [29]. In another study, experiential learning increased correctional officers' mental health knowledge ($p \leq 0.02$) [47]. A recent evaluation of co-designed 'Enhancing Care of the Aging and Dying in Prisons' learning modules demonstrated an improvement in affective and cognitive outcomes ($p \leq 0.0001$) across seven correction sites [36]. Results suggest experiential learning co-designed with the prison workforce has the most significant impact on capacity building in prisons [29, 33, 36].

Organizational level strategies

More complex capacity-building strategies that combined individual and organizational level strategies also generated better outcomes [32, 37, 38, 41, 46]. Managerial support was vital in successfully implementing online webinars for justice health nurses working in a rural prison [41]. Managers who actively organized and promoted educational opportunities significantly enhanced the feasibility of participation [41]. Significant investment in ongoing professional development and sustained learning can improve healthcare quality in correctional settings [41]. Similarly, Long, LaPlant and McCormick [46] found frequent engagement and education regarding antimicrobial stewardship across 122 prisons led to significant improvements. Given the complexity of the prison environment, continuous real-time problem-solving and education were crucial for Justice Health clinicians maintaining best practice antibiotic stewardship behaviour [46].

The introduction of a three-level suicide rating scale, which categorized individuals based on their suicide risk (Level 1 for verbal threats, Level 2 for suicidal gestures, and Level 3 for serious suicide attempts) was a successful infrastructure strategy [32]. This risk stratification system helped increase the prison workforces suicide risk factors knowledge, more effectively identify and monitor individuals at risk, leading to a reduction in completed suicides[32]. Organizational capacity-building strategies (e.g., clinical champions, a national closed formulary, clinical practice guidelines and antimicrobial stewardship) led to a significant reduction in antibiotic prescription rates across four USA prisons [46]. Monthly benzodiazepine prescription review meetings involving psychiatrists and pharmacists lead to lower benzodiazepine doses for people in prison, particularly those taking high doses [45]. The introduction of Hepatitis B screening and vaccination programs across fifteen prisons resulted in most (91.3%) of the prison population being screened and 67% of at-risk individuals receiving their first Hepatitis B vaccination [38]. Using cultural mediators and peer educators to support individuals from multi-ethnic backgrounds and a preparedness to adapt the program based on early feedback was central to this program's success [38]. Structured opportunities for reflection and learning, supported by management and strategies tailored to the unique prison context, collectively improved the prison workforce's engagement and care provision [32, 37, 38, 41, 46].

Individual, organizational infrastructure and community strategies

Results indicate frequent, multi-level capacity-building strategies across individual, organizational, and community levels produce better and more sustainable outcomes in correctional settings. High-intensity engagement across the three capacity-building levels improved mental health treatment in a rural correctional facility by focusing on the consistent development of trainee psychologist skills, long-term infrastructure development, and strong prison, university and federal judiciary partnerships to ensure adaptability and long-term sustainability [29]. Integrating the role of correctional health within broader community health supported by integrated electronic medical records improved continuity of care and health outcomes [31]. Evidence from a pharmacotherapy program involving psychiatrists and pharmacists, utilizing multilevel capacity-building strategies, effectively reduced benzodiazepine use among people in prison over 15-years [45].

Ongoing education (i.e., advancing knowledge and skills through monthly meetings), infrastructure development (i.e., systematic prescription review and the creation of guidelines), and fostering partnerships (i.e., teamwork between healthcare professionals). The consistent application of these approaches over time led to significant reductions in high-dose benzodiazepine prescriptions and improved medication management within the prison system [45]. A variety of strategies were used to increase correctional staff's capacity to manage the mental health needs of people in prison, including theoretical learning over a four-day workshop, a psychoeducational approach through problem-based learning with simulations and role-play, two days of observational experience with structured personal exposure, and peer supervision sessions equating to 12 occasions of engagement [47]. Davidson [48] also employed a number of strategies to engage learners, focusing on active learning strategies, including

role-playing exercises, to reinforce skill development; refresher training to strengthen the skills and knowledge gained from initial training; and mentorship through newly trained officers being paired with veterans for brief periods of field training, allowing them to apply their new skills in real-world scenarios under the guidance of experienced personnel. Training a diverse group of professionals with a high frequency of engagement ($n = 5$) across both law enforcement and corrections systems developed a more informed and capable infrastructure for managing mental health crises, empowering multiple sectors of the community to address mental health concerns [40] effectively.

A more recent study led by McNeeley and Donley [40] addressed capacity-building strategies at all three levels, leading to improved capacity for mental health care provision. At the individual level, CIT enhanced correctional officers'knowledge and skills in mental health crisis management and de-escalation techniques. At the organizational level, the implementation of CIT expanded the support and infrastructure for mental health interventions within the correctional system, helping to institutionalize these practices. Finally, at the community level, the CIT model fostered partnerships with external mental health services, ensuring that people in prison had access to necessary mental health resources through referrals exemplified by the proportion of employees with CIT training were positively related to a mental health referral ($p = 0.002$). These strategies combined to build capacity in managing mental health crises in correctional facilities [40].

Facilitators and barriers

The key facilitators critical to the success of implementation and sustainability of capacity-building strategies in correctional settings were interdisciplinary collaboration, program flexibility, practical training methods, and the creation of supportive organizational environments (see Table 3). Conversely, the barriers highlight the challenges that hinder progress, including resource limitations, logistical constraints, and pervasive stigma and resistance to change within correctional institutions. An example of this resistance to change is seen in the recent Lai, Fiona Mair [37] study, where correctional staff declined monthly supervision. Time and resource constraints made it difficult for most correctional staff to translate their new knowledge into practice [44]. This highlights the challenges of translating potentially effective strategies in resource-constrained prison environments where participation is voluntary [44] and the need for multiple strategies across the three organizational levels (individual/organization and community) to achieve better outcomes [40].

Discussion

This systematic review highlights the growing complexity of prison healthcare needs and the lack of well-designed capacity-building strategies that have effectively improved healthcare outcomes since the introduction of the UN Mandela Rules. This gap underscores the need for comprehensive, evidence-based approaches to address healthcare disparities, particularly for First Nations people and older people in prison [51].

Building the prison workforce's healthcare capabilities

While the most successful strategies include action at all three capacity-building levels [23], this was rarely adopted. Since 2015, most capacity-building efforts in prison healthcare have focused on low-frequency individual-level strategies that rely on less effective and less preferred didactic educational approaches [22, 31, 32, 34, 38, 42–44]. While few interactive strategies were employed, those that did deliver better healthcare outcomes for people in prison [29, 30, 39, 40, 45, 47, 48]. Few of the individual-level strategies utilized adult learning principles [52] or experience as a basis for learning [53].

Individual-level capacity-building strategies in correctional settings ought to be grounded in adult-learning principles that respect autonomy, recognize prior knowledge, are experiential-based [43, 47, 48] and simulate forensic patients'care needs [54] using problem-focused learning that can be promptly applied [55]. To be more effective, they should also consider adopting coaching, mentoring, technical assistance, in-depth consultations, virtual or in-person training sessions, online learning options, guidance materials, or skill-based courses. [56].

While building individuals' capabilities is necessary, most organizations that rely solely on training for job performance achieve a success rate of less than 15%. [28]. Organizational support is critical to designing sustainable, systemic, and multilevel training that improves outcomes, as demonstrated in other multi-disciplinary workforces, such as early childhood education [57], residential aged care [58, 59], and disability care [60] sectors. Processes that reinforce, monitor, encourage, and reward performance in combination with individual capacity-building strategies can expect 85% application of training, knowledge and skills to the role [28]. Infrastructure adjustment, resource allocation, active leadership involvement, and commitment to sustainability effectively built capacity in one study [31]. Investing in

Table 3 Facilitators and barriers table

Focus	Facilitators	Source
Interdisciplinary collaboration & partnerships	Cross-disciplinary partnerships and collaboration	[29]
	Collaboration between people in prison and the prison workforce to develop resources	[29]
	Multidisciplinary cooperation involving professionals from diverse fields	[33]
	Long-term commitment from leadership figures to champion and guide	[34]
	Critical insights from the expert advisory and community advisory boards to tailor strategies	[36]
	Leveraging peer educators to mitigate trust issues and facilitate engagement	[38]
	Integration of policies that promote the consistent application of learned skills	[39]
Program flexibility and adaptability	Flexibility in scheduling, allowing participants to attend sessions as able	[33]
	Curricula adaptable to different settings and participant needs	[42]
	Flexibility in scheduling to accommodate participants across various shifts	[31]
	Co-design of training materials with input from relevant stakeholders	[44]
	Customizable training formats (e.g., full-day, half-day, mini-training modules)	[42]
Practical and experiential training methods	Application of case-based learning using real-world scenarios	[33]
	Practical role-playing to enhance the acquisition and retention of skills	[40]
	Hands-on, group-based training sessions to facilitate learning	[43]
	Interactive, in-person training with opportunities for real-time engagement	[31]
Supportive organizational structures	Engaging trainees in the establishment and ongoing sustainability of capacity-building through hands-on experience	[29]
	Organizational support from supervisors and management, increasing participant confidence	[39]
	Institutional backing is critical for reaching a broad audience across multiple sites	[44]
Tailored and contextually relevant content	Familiarity with sociopolitical factors relevant to the intervention's context	[29]
	Perceived relevance and practical applicability of the training content	[30]
	Tailoring training resources to the unique needs of correctional settings	[43]
	Adapting materials to the prison environment, enhancing usability and relevance	[37]
Sustainability and communication	Ongoing consultation, biannual refreshers, and continuous assessment	[34]
	Maintaining communication with staff at correctional facilities	[29]
	Continuous learning through sustained trainee involvement	[29]
	Incorporating outcome measures to evaluate the impact of the strategy	[29]
Use of technology & digital media	Incorporation of digital media into content creation, increasing engagement and accessibility	[42]
	Recorded training sessions (e.g., via DVD) for broader and future use	[22]
	Exploration of telehealth and remote work options to extend access	[29]
Focus	**Barriers**	**Source**
Stigma & resistance to change	Stigmatization relative to substance use disorder and corrections, hindering engagement	[29]
	Stigma surrounding mental health in the workplace, discouraging participation	[30]
	Resistance to adopting new treatment modalities for opioid use disorder (OUD)	[33]
	Staff resistance to implementing trauma-informed practices	[34]
	Reluctance and mistrust from people in prison towards the prison healthcare system	[38]
	Institutional resistance to change due to high levels of stress and pre-existing demands on staff	[44]
	Correctional culture of negative attitudes toward mental health and rehabilitation	[39]
	Pre-existing negative attitudes toward certain training topics, particularly mental health	[47]
Resource constraints	Insufficient funding to support programs and strategies	[29]
	Resource constraints, including limited staffing, funding, and medical supplies	[38]
	Lack of resources for therapeutic support, such as counselling and other outlets	[34]
	Limited access to online tools and software to facilitate training	[41]
	High workload and competing priorities within healthcare services	[43]
	Limited access to digital technology and other supporting infrastructure	[41]

Table 3 (continued)

Logistical and scheduling challenges	Conflicting schedules that hinder participation in training programs	[29]
	Inadequate transportation options to facilitate access to training or treatment	[29]
	Frequent facility lockdowns disrupt program continuity	[29]
	Limited availability of usable spaces for training or strategies	[29]
	Lack of dedicated time for correctional officers to implement learned practices	[37]
	High turnover of staff impeding the sustainability and continuity of training programs	[44]
	Time constraints due to heavy workload	[31]
Limited organizational support and engagement	Difficulty identifying supportive staff to champion program development and implementation	[29]
	Challenges in maintaining engagement from trainees, community, and facility staff	[29]
	Lack of broader organizational support to ensure consistency in applying learned strategies	[40]
	Trainers lacking firsthand experience in correctional settings, affecting their credibility and impact	[42]
Training decay & continuity	Desensitization to issues over time, reducing the vigilance required to identify and intervene effectively	[32]
	Skill decay when training is not followed by ongoing reinforcement or support	[48]
Cognitive & educational limitations	Training resources overly complex for participants with cognitive deficits or varied levels of education	[43]
	Complex patient needs, presenting significant challenges in managing the balance between care provision and resource availability	[45]

organizational change that creates a positive learning culture can lead to better health outcomes by enhancing teamwork and communication, fostering continuous learning, and improving training program engagement [58]. Adopting a flexible model that supports continuous quality improvements to sustain best practice [59] could be readily replicated within correctional settings.

Establishing effective community partnerships is essential because many determinants of health are outside the realm of the initial (i.e. prison) health service [17]. The power of a cohesive community-level capacity-building healthcare partnership that provides ongoing supervision and support to correctional staff can lead to more appropriate in-reach healthcare referrals for people in prison [48, 61] and a positive reduction in the use of force and associated injury [48]. Combined with continual peer and supervisor support, a collaborative in-reach model is most likely to influence positive sustained transference of learned knowledge, skills and attitudes [62]. Although implementing these strategies can be challenging, integrating clinical decision support systems into existing healthcare infrastructure can have positive long-term impacts [62]. However, the lack of documented long-term follow-up introduces uncertainty regarding the sustainability of these strategies [31].

Changing population needs

A clear gap emerging from this systematic review is the need to develop capacity-building strategies that enable the prison workforce to meet better the needs of First Nations people, older people in prison, and the growing number of people living with multiple co-morbidities. Research indicates a need to build the required competencies necessary for working with people in prison who belong to cultural, ethnic or religious minorities. [63]. This systematic review found that very few capacity-building strategies included the cultural, ethnic or religious needs of people in prison. Due to the high numbers of First Nations people incarcerated globally [6, 64, 65] that are aging [10], a cultural lens needs to be applied to all future capacity-building strategies.

Enabling earlier identification of the declining health in older people, including those with aged, chronic and palliative care needs would help facilitate better healthcare management and outcomes for this population [66]. Increasingly, correctional staff will be called upon to identify the declining health of older people in prison, including cognitive decline, much earlier in their illness trajectory and to promptly refer those with unmet needs to their justice health colleagues [22, 48, 67–69]. The prison environment can mask the onset of cognitive decline with disruptive or aggressive behavior often misinterpreted as being related to the person's comorbid mental health, intellectual disability, or drug use [70]. The inability of correctional staff to differentiate between these states often results in people being reprimanded for intentional rule-breaking rather than their behavior being linked to undiagnosed dementia [70]. As the prison population continues to age and the incidence of dementia increases, the need for dementia training in prisons will increase [70]. This changing profile requires a well-prepared correctional workforce with the capacity to

identify people in prison's changing healthcare needs and clearly defined pathways that allow for timely referral to justice health.

Research implications

Most prison healthcare capacity-building has focused on mental health, crisis intervention, managing blood-borne pathogens, and opioid misuse training [71]. Human rights, tolerance and rehabilitation, along with understanding the religious, cultural, and ethnic needs of people in prison, are rarely the focus of correctional staff training [71]. Few capacity-building strategies have focused on preparing the correctional workforce for the changing needs of a more culturally diverse, aging prison population living with multi-morbidity who are increasingly likely to have future palliative care needs.

Further research is required to determine the most effective capacity-building strategies for correctional and justice health professionals to address the complex healthcare needs of people in prison. More extensive and well-designed comparative studies between countries, criminal justice systems, and correctional settings may aid in developing capacity-building strategies applicable to a broader range of settings. Given the complex nature of capacity-building, there is a need to move beyond immediate and simple evaluations to longstanding measurements. Applying the Donabedian approach to structure, process, and outcomes measurement [72] will enable a better assessment of the impact of future health-related capacity-building strategies in correctional settings.

The adoption of co-designed principles that incorporate the lived experience and acknowledge the nuanced prison environment [73] would greatly assist with the development of more tailored capacity-building strategies. Engagement with a representative spread of stakeholders and the prison workforce in co-design work [74] will increase the likelihood of successful implementation and more effective translation into policy and practice [75].

Cultural perspectives were a notable gap in this systematic review, with only one study incorporating cultural needs [38]. Yet, it is identified as an influential factor [42]. Transitioning from didactic to co-designed interactive, culturally intelligent, evidence-based approaches is most likely to build the prison workforce's capacity to recognize and respond to First Nation peoples evolving healthcare and cultural needs. Given the decay of knowledge post-training [48, 69] training at regular intervals may be required [22]. Future research needs to determine the most effective interval for incorporating First Nation cultural needs.

Strengths and limitations

This systematic review's major strength is its systematic methodology. The screening for inclusion, completed independently by two reviewers, ensures that the included studies are relevant and few are likely to have been missed. The systematic approach to data extraction, analysis, and synthesis of information confers confidence in study outcomes.

A limitation of this systematic review is the inclusion of studies generating low levels of evidence with a high risk of bias and wide variance in study designs, small sample sizes, minimal long-term follow-up data, and non-existent data beyond service utilization. The samples are also at risk of bias due to non-responsiveness, and missing data from incomplete responses may have skewed the results. The distal relationship between building the prison workforce's capacity to provide trauma-informed care and only targeting one aspect of QoL may have impacted these results [34]. As most of the studies were undertaken in the USA and UK, this precludes broader generalization.

Conclusion

Broad capacity-building approaches are required to build the prison workforce's competence to recognize and respond to people in prisons' complex and increasingly deteriorating healthcare needs. Co-designing these strategies with the prison workforce is pivotal to improved engagement, retained skill development and outcomes. Ensuring any health capacity-building initiative is undertaken in partnership with Justice Health and supported through formalized partnerships with other relevant health providers is also key to sustaining practice improvement. Partnership work (corrections, health staff, cultural consultants) focused on providing supervision, observational service orientation, and ongoing training at organizational and community levels shows promising impact.

Supplementary Information

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Supplementary Material 1.

Supplementary Material 2.

Supplementary Material 3.

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