



Pharmacy practice and First Peoples health equity: A scoping review[☆]

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ABSTRACT

Background: First Peoples health inequity is observed globally in higher rates of chronic disease compared to non-First Peoples. Pharmacy practice is an essential component of chronic disease management; achieving a good health-related quality of life and the best clinical outcomes requires optimal pharmaceutical care.

Aim: To identify pharmacy practice strategies and interventions, across the globe, contributing to achieving First Peoples health equity; including reported outcomes, impact, implementation barriers/enablers and identification of practice gaps.

Method: PRISMA-ScR followed for reporting and review protocol is published. Inclusion criteria comprised First Peoples, reported strategies and/or interventions aligned to international conceptual model for pharmaceutical practice, study motive to achieve First Peoples equitable healthcare. Included articles mapped to a contemporary framework and underwent inductive content analysis.

Findings: Thirty-six studies were reviewed from Australia (39 %), the United States of America (36 %), New Zealand (17 %), Canada (5 %) and Brazil (3 %). Three main strategies emerged, clinical pharmacy practice, medicines access and managing medicines. Advanced pharmacy practice improved clinical outcomes with significant decreases in specific chronic disease target indicators along with reductions in emergency department visits and hospitalizations reported; social needs screening and referral highlighted as a major gap.

Conclusion: Advanced pharmacy practice models of care are urgently required to maximize the pharmacy professions contribution to achieving First Peoples health equity. Culturally appropriate, innovative, flexible models incorporating social requirements will generate the greatest impact. Pharmacists require high level communication/leadership skills and an understanding of First Peoples health determinants to build authentic patient-practitioner partnerships, increase community engagement and lead transformative change.

1. Introduction

First Peoples essence and cultures are evolving and thriving in many parts of the world despite the continuing negative impacts on health of social and structural determinants. First Peoples health inequity is observed globally though, in higher rates of chronic disease such as obesity, diabetes, hypertension, cardiovascular disease (CVD), and chronic renal failure, compared to non-First Peoples.¹ Pharmacy practice is an essential component of chronic disease management, with the majority of people living with one or more chronic diseases needing

medication for life.² Achieving a good health-related quality of life and the best clinical outcomes for people living with chronic diseases requires optimal medication therapy and pharmaceutical care.^{2,3} In Australia, New Zealand, Canada and the United States it is being increasingly recognized that without quality use of medicines, including medicines access, First Peoples health equity cannot be achieved.^{4–7}

There are currently no global reviews depicting pharmacy practice strategies and interventions aimed at achieving First Peoples health equity.⁸ Wenger et al.,⁹ undertook a review related to pharmacist interventions and health disparities however this covered all populations

[☆] VW identifies as a Gugu Badhun woman (Valley of Lagoons/Ewan Country) and is the cultural lead, providing advice and leadership to the other authors. KC and ST work on Bindal and Wulgurukaba lands; MR and KMc work on Gimuywalubarra Yidi lands; and AC works on Mbabaram lands. We acknowledge Aboriginal People and Torres Strait Islander People as the first inhabitants of the Australian nation and as the Traditional Custodians of the Australian lands on which we work.

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and focused on mental health⁸; Fazelipour et al.,⁵ reviewed First Peoples pharmacy services for developing health curricular however their review was limited to qualitative studies in four countries. The review by Ozaki et al.,¹⁰ analogous in its relation to worldwide pharmacist interventions to counter health disparities, is nevertheless intrinsically different; it is not specific to First Peoples, nor does it utilize a contemporary framework to identify evidence gaps. A comprehensive review, encompassing all aspects of pharmacy practice and its contribution to achieving First Peoples health equity is of vital importance; informing the profession of its current position and enabling transformative change.⁸

Realizing First Peoples medicines optimization has been described as multi-faceted involving all members of the healthcare team along with a culturally appropriate partnership with the patient.⁶ Pharmacists, delivering true patient-centred care,¹¹ are leaders in facilitating First Peoples medicines optimization as they are experts in medicines with responsibility for the outcomes of medication therapy.¹² It has been purported there is potential to widen access to medicines optimization services through expanding pharmacists scope to undertake tasks such as ordering of pathology, case management and co-prescribing, this is known as advanced pharmacy practice.¹³ In addition, pharmacists are recognized by the World Health Organization (WHO) as having a leadership role in healthcare systems¹⁴; with pharmacists cited as being well placed to lead the transformation and change required to address health inequities.¹⁵ This is important because, First Peoples across the globe, experience profound health inequity related not only to the social determinants of health but also to structural determinants. These include but are not limited to, colonisation, intergenerational trauma, marginalization, systemic discrimination, as well as government policies and programs, for example the Stolen Generations in Australia and the Residential School system in Canada.^{4,5} Amnesty International articulates the world has 476 million First Peoples, dispersed throughout 90 countries, including Europe and Asia (70 %), comprising of 5000 discrete First Peoples with 4000 spoken languages.¹⁶ To recognize and respect their cultural diversities and identities, this scoping review will use the terminology First Peoples instead of Aboriginal or Indigenous^{8,17}; although these latter terms may appear in the studies included in this review.

Preventable health inequities are attributed by the WHO to the conditions in which people live and function along with the quality of health systems available to them.¹⁸ These conditions are commonly referred to as the social determinants of health (SDOH) and include factors that impact on health such as housing, the built environment, social and community context, healthcare access and socioeconomic status (SES).¹⁹ Curtis et al.²⁰ expanded on common SDOH by adapting the 'Williams model' to illustrate the effect of colonization on health and assist with understanding determinants of First Peoples health inequities.^{21,22} Swidrovich, a strong voice for First Peoples in relation to pharmacy practice, states "attempts to improve the health and wellness of First Peoples must be inclusive of such determinants (land, colonization) of First Peoples' health"^{23(p2)}.

For populations where inequities are known to exist, emerging evidence describes opportunities for pharmacy practice to provide a unique and valuable contribution to achieving health equity.^{15,24–26} Kiles et al.²⁵ are the first to conceptualise a framework, as shown in Fig. 1, articulating proposed strategies and interventions to achieve sustainable health equity at a patient, practice, and community level²⁵; henceforth referred to as the Kiles et al.²⁵ framework. This framework is not specific for First Peoples health equity however it is considered to align with First Peoples paradigms.⁸

The aims of this scoping review were to 1) identify pharmacy practice strategies and interventions contributing to achieving First Peoples health equity, including reported outcomes and how impact was measured; 2) map identified strategies and interventions to the Kiles et al.²⁵ framework and 3) identify barriers and enablers to implementation. This scoping review will significantly increase the



Fig. 1. The role of the pharmacist in impacting SDOH at the community, practice and patient level by Kiles et al.²⁵.

professions understanding of how pharmacy practice is currently contributing to achieving First Peoples health equity and provide future signposting. It is envisioned this review will be used to inform potential changes in practice and assist with policy development.

2. Method

A scoping review, utilizing Best Practice Guidance and Reporting Items for the Development of Scoping Review Protocols,²⁷ and conducted according to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses extension for Scoping Reviews (PRISMA-ScR), was completed.²⁸ The scoping review protocol was registered prospectively with the Open Science Framework on 8 October 2023 (<https://osf.io/qa64b>) and has been published.⁸

2.1. Search strategy

A comprehensive literature search from 1 January 1998 to 8 October 2023, was completed and updated on 8 December 2024 using the following electronic databases: Embase (Elsevier), MEDLINE (Ovid), Scopus (Elsevier), CINAHL (EBSCO). A gray literature search was undertaken and included ProQuest Platform (all source types) and the Indigenous Studies Portal, [Informit.org](https://www.informit.org), Native Health Database and Australian Indigenous HealthInfoNet databases. Search terms included Indigenous, Aboriginal, Māori, Torres Strait Islander, First Nations, First Peoples, Native Peoples, American Indians, health inequities, health equity, health disparities, pharmacists, pharmacy, pharmacy services and medication systems. Full details of the MEDLINE (Ovid) database search strategy can be found in appendix 1 of the published protocol.⁸ Reference lists of studies included in the review were screened for additional sources; identified systematic, scoping or literature reviews were screened for appropriate studies which were then extracted and analyzed.

2.2. Inclusion and exclusion criteria

Studies were included if participants were First Peoples, their families or communities, reported strategies and/or interventions aligned to the international conceptual model for pharmaceutical practice²⁹; and study motive was to achieve equitable healthcare for First Peoples. For the purposes of this review, pharmacists practicing pharmaceutical care and not dispensing medications are referred to as clinical pharmacists,¹⁴ and pharmacists employed in retail pharmacies are referred to as community pharmacists. In addition, where conventional roles are surpassed this is referred to as advanced pharmacy practice¹³; and pharmacists working at this full scope referred to as advanced practice pharmacists. International literature from any cultural or geographical context was

considered with no restriction on language. Qualitative, quantitative, and mixed methods methodologies along with practice reports, conference abstracts, theses, government reports and unpublished studies were included; editorials and opinion pieces were excluded.

2.3. Extraction and analysis

The study selection process for this review is shown in Fig. 2. The selected studies were imported into EndNote v.20 (Clarivate Analytics, PA, US) and duplicates were removed. Citations were then uploaded into the JBI System for the Unified Management, Assessment and Review of Information (JBI SUMARI) (JBI, Adelaide, Australia) and screened by two independent reviewers (MR) and (KMc) with a third reviewer (KC) as adjudicator if required; a pilot step occurred at each stage of screening.⁸ Data extraction was undertaken by two reviewers (MR) and (KMc) using a modified JBI data extraction tool.⁸ Extracted data consisted of author, publication year, country, study design, participants, setting, strategy and/or intervention, as well as outcome measures. Outcomes were classified according to the 'Economical, Clinical, and Humanistic Outcomes (ECHO) model'³⁰ a seminal framework adopted by the pharmacy profession for evaluating pharmaceutical care interventions. The ECHO model³⁰ provides a balanced approach to health service evaluation in recognition that outcomes types are inter-dependent; it is purported the ideal pharmacy practice evaluation would measure for all three outcomes. Identified key strategies and interventions were mapped against those proposed in the Kiles et al.²⁵ framework, at the patient, practice (system) and community level. Simple inductive content analysis³¹ was undertaken by the lead author (MR) to determine the key enabler and barrier concepts in relation to

implementation of the strategies and interventions. Articles were not excluded based on the quality of the study.

3. Results

A total of 1864 records were identified through database, journal and bibliography searching of which 328 were duplicates (Fig. 2). Following duplicate removal, along with title and abstract screening, there were 88 full text studies screened for eligibility; on completion of full text review, 36 studies were included in this scoping review with results and key characteristics summarized in Table 1. The majority of studies were quantitative^{7,32–57} (n = 27, 75 %); with qualitative^{58–60} (n = 3, 8 %) and mixed methods^{1,61–65} (n = 6, 17 %) studies representing a much smaller number. Included studies comprised of 32 journal manuscripts,^{1,7,32,34,36–54,57–65} one government report,⁵⁶ one thesis⁵⁵ and two conference abstracts.^{33,35} Eight studies were prospective^{32,37,38,46,47,50,53,62} of which three were randomized controlled trials (RCTs).^{46,47,50} Publication dates spanned from 2006 to 2024 with over a third of studies (n = 14) published after 2020.^{1,7,33,38,40,42–44,52,53,57,62,63,65}

Australia reported the most studies^{34,40,47,51–53,56,58,59,61,63–65} (n = 14, 39 %), closely followed by the United States of America (US)^{7,32,35–37,41–45,48,49} (n = 13, 36 %) with the remainder from New Zealand^{33,38,39,46,50,55,62} (n = 6, 17 %), Canada^{1,57} (n = 2, 5 %) and Brazil⁵⁴ (n = 1, 3 %). The main setting was community^{1,7,33–35,38,41,42,45–50,52,54–63,65} (n = 26, 72 %) inclusive of primary care clinics (n = 14).^{1,7,33–35,41,42,45,48,49,59–61,63} A total of seven studies reported a combination of settings comprising of primary care clinics, community and/or hospital^{32,36,37,39,40,51,64} (19 %) with two studies emanating from a hospital setting^{40,53} (6 %); there were no studies exclusively from

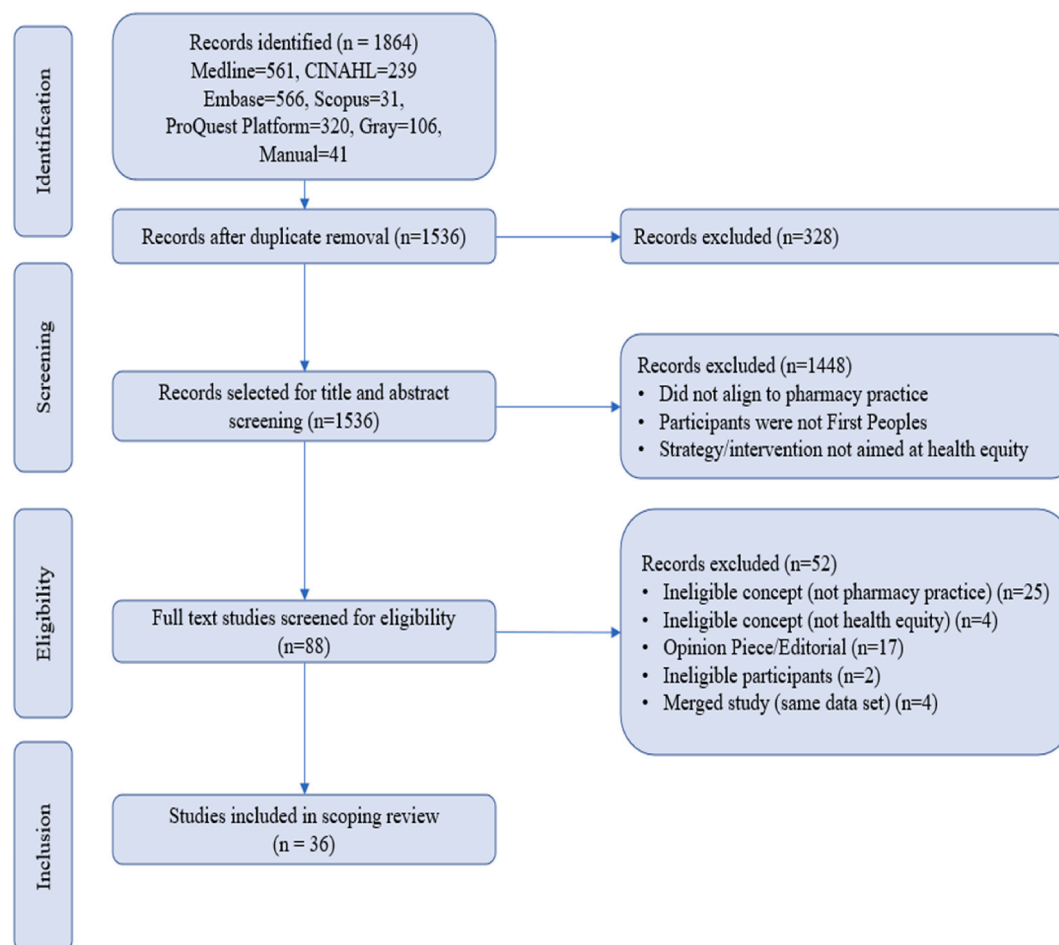


Fig. 2. PRISMA flowchart of scoping review study selection.

Table 1
Key study characteristics.

Author, Publication year, Country	Study design, Population description and Sample size	Intervention or Strategy	Reported outcome type (ECHO)	Kiles et al. ²⁵ framework, Mapped levels
Clinical Pharmacy Practice				
Deidun et al., 2019, Australia	Quantitative, Retrospective review; Aboriginal and Torres Strait Islander Peoples; (n = 64), one First Peoples primary healthcare service, remote location	1. Medicines review and optimization	1. Clinical 2. Humanistic	1. Patient 2. Practice 3. Community
Drovandi et al., 2022, Australia	Mixed methods, pragmatic pre and post quasi-experimental, participatory; Aboriginal and Torres Strait Islander Peoples; (n = 17/104, 16 %) 20 First Peoples primary healthcare services	1. Medicines review and optimization	1. Humanistic	1. Patient 2. Practice
Duck, B., 2020, New Zealand	Quantitative, descriptive study, Maori and Pacific Islander Peoples (n = unknown), primary healthcare practices, rural	1. Medicines optimization 2. Advanced pharmacy practice	2. Clinical	1. Practice 2. Community
Swain L., Barclay L., 2015a, Australia	Qualitative descriptive study, Aboriginal Health Workers; (n = 14/31, 45 %), 11 First Peoples primary healthcare services, urban, regional, rural, and remote	1. Medicines review and optimization	1. Humanistic	1. Patient 2. Practice 3. Community
Swain L., Barclay L., 2015b, Australia	Qualitative explorative study, focus groups, thematic analysis: Aboriginal and Torres Strait Islander Peoples; (n = 102) 11 First Peoples primary healthcare services, urban, regional, rural, and remote	1. Medicines review and optimization	1. Humanistic	1. Patient 2. Practice 3. Community
Harrop et al., 2024, Australia	Quantitative, pre-post, quasi-experimental (compared to non-First Peoples cohorts), interventional study: Aboriginal and Torres Strait Islander Peoples; (Pre n = 199 vs 440, 45 %, Post n = 119 vs 467, 26 %) Tertiary Hospital, Cardiac Unit, Metropolitan	1. Medicines optimization 2. Care coordination	1. Clinical	1. Patient 2. Practice 3. Community
Deming et al., 2018, (US)	Quantitative service evaluation; American Indian and Alaska Native Peoples; (n = 31) 13 clinical sites	1. Medicines review and optimization 2. Pharmacy-led clinic 3. Case-conferencing 4. Telepharmacy	1. Clinical	1. Patient 2. Practice
Duvivier et al., 2017, US	Quantitative service evaluation; American Indian and Alaska Native Peoples (n = unknown) Indian Health Service-wide	1. Medicines review and optimization 2. Advanced pharmacy practice	1. Clinical 2. Humanistic	1. Patient 2. Practice 3. Community
Gallegos et al., 2022, US	Quantitative service evaluation; American Indian Peoples; (n = 3500), regional and rural location	1. Medicines review and optimization 2. Advanced pharmacy practice 3. Telepharmacy	1. Economic 2. Clinical 3. Humanistic	1. Patient 2. Practice 3. Community
Geiger et al., 2018, US	Quantitative service evaluation; American Indian and Alaska Native Peoples; (n = 1789) 11 separate IHS facilities, rural	1. Medicines review and optimization 2. Advanced pharmacy practice 3. Case-conferencing	1. Clinical	1. Patient 2. Practice
Martin et al., 2015, US	Quantitative service evaluation; American Indian and Alaska Native Peoples; (n = 30) one First Peoples primary healthcare service, rural location	1. Medicines review and optimization 2. Pharmacy-led clinic	1. Clinical 2. Humanistic	1. Patient 2. Practice 3. Community
Moore et al., 2014, US	Quantitative service evaluation; American Indian and Alaska Native Peoples (n = 4058) 7 IHS hospitals/clinics, 21 Tribal healthcare programs and 2 urban programs across 13 US states	1. Advanced pharmacy practice 2. Case Management 3. Medicines optimization	3. Clinical	1. Patient 2. Practice 3. Community

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Table 1 (continued)

Author, Publication year, Country	Study design, Population description and Sample size	Intervention or Strategy	Reported outcome type (ECHO)	Kiles et al. ²⁵ framework, Mapped levels
Lawrence et al., 2019, New Zealand	Quantitative program evaluation; Māori and Pacific Peoples; (n = 630/887, 71 %) primary healthcare in a region	1. Medicines optimization	1. Clinical 2. Humanistic	1. Patient 2. Practice
O'Connell et al., 2022, US	Quantitative, retrospective longitudinal data analysis; American Indian and Alaska Native Peoples; (n = 9844) adults aged 18 and older, 5 locations	1. Medicines review and optimization 2. Advanced pharmacy practice	1. Clinical *SDOH were used to measure impact on clinical outcomes	1. Patient 2. Practice 3. Community
O'Connell et al., 2021, US	Quantitative, retrospective longitudinal data analysis; American Indian and Alaska Native Peoples; (n = 28,578) 15 IHS units	1. Medicines review and optimization 2. Advanced pharmacy practice 3. Case-conferencing	1. Clinical	1. Patient 2. Practice 3. Community
Pett et al., 2016, US	Quantitative, retrospective chart review, pre and postintervention; American Indian and Alaska Native Peoples; (n = 61) one First Peoples primary healthcare service	1. Medicines review and optimization 2. Pharmacy-led clinic	1. Clinical	1. Patient 2. Practice
Rose J.L., 2007, US	Quantitative, cross-sectional study; Alaska Native and American Indian Peoples; (n = 990) 12 remote sites	1. Medicines review and optimization 2. Telepharmacy	1. Economic 2. Clinical	1. Practice
Weston-Buffalohead J.M., 2007, US	Quantitative, descriptive, secondary data; American Indian Elders; (n = 36) one residential care home	1. Medicines review and optimization	1. Clinical	1. Patient 2. Practice 3. Community
Hikaka et al., 2021a, New Zealand	Quantitative feasibility study; Māori Peoples; (n = 17) adults aged 55 and older, community-dwelling	1. Medicines review and optimization	1. Clinical 2. Humanistic	1. Patient 2. Practice
Hikaka et al., 2021b, New Zealand	Mixed Methods, structured interview with open ended questions post intervention; Māori Peoples; (n = 17) adults aged 55 and older, community-dwelling	1. Medicines review and optimization	1. Humanistic	1. Patient 2. Practice
Erker et al., 2021, Canada	Mixed methods service evaluation; Canadian First Nations Peoples; (n = 66) one First Peoples primary healthcare service	1. Medicines review and optimization	1. Clinical 2. Humanistic	1. Patient 2. Practice
Rick et al., 2017, US	Quantitative, controlled quasi-experimental study and retrospective analysis of secondary data; American Indian Peoples; (n = 48) three retail sites	1. Medicines optimization 2. Innovative partnerships	1. Clinical 3. Humanistic	1. Patient 2. Practice 3. Community
Medicines Access				
Mitchell et al., 2020, Australia	Quantitative case study; Aboriginal and Torres Strait Islander Peoples; (n = 296), one hospital location	1. Medication subsidy	1. Economic	1. Patient 2. Practice 3. Community
Trivedi et al., 2017, Australia	Quantitative observational time trend study, pre and post intervention; Aboriginal and Torres Strait Islander Peoples (n = 42,651) age 15 years and older in 16 urban, regional, and remote locations	1. Medication subsidy	1. Clinical	1. Patient 2. Community
Trivedi et al., 2020, Australia	Quantitative quasi-experimental study, pre- and post-intervention, comparison group; Aboriginal and Torres Strait Islander Peoples; (n = 1948) state-wide	1. Medication subsidy	1. Economic	1. Patient 2. Community

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Table 1 (continued)

Author, Publication year, Country	Study design, Population description and Sample size	Intervention or Strategy	Reported outcome type (ECHO)	Kiles et al. ²⁵ framework, Mapped levels
Kelagher et al., 2006, Australia	Mixed-method federal government program evaluation; Aboriginal and Torres Strait Islander Peoples; (n = 36 %) 153 remote health services Australia-wide	1. Medication subsidy	1. Economic 2. Humanistic	1. Patient 2. Practice 3. Community
The Senate, 2011, Australia	Quantitative Federal Government report; Aboriginal and Torres Strait Islander; (n = 170,000) 173 remote First Peoples primary healthcare services	1. Medication subsidy	1. Economic 2. Humanistic	1. Patient 2. Practice
dos Santos, 2015, Brazil	Quantitative, retrospective descriptive study; Native Brazilian Peoples; (n = unknown) Nation-wide, Indigenous health care system data	1. Rationalized access to essential medications (Quality Use of Medicines, QUM)	1. Economic	1. Patient 2. Practice 3. Community
Patel et al., 2015, Australia	Quantitative randomized, open label trial; Aboriginal and Torres Strait Islander Peoples; (n = 315/623, 50 %), primary healthcare, various sites	1. Innovative Drug Formulation	1. Clinical	1. Patient 2. Practice
Liu et al., 2015, Australia	Qualitative, semi-structured interviews; Aboriginal and Torres Strait Islander Peoples; (n = 24/94, 26 %), primary healthcare centers, various locations	1. Innovative Drug Formulation	1. Humanistic	1. Patient
Pilcher et al., 2014, New Zealand	Quantitative randomized controlled trial (RCT); Māori Peoples; (n = 44/303, 15 %), various sites	1. Innovative Drug Formulation	1. Clinical	1. Patient 2. Practice
Selak et al., 2016, New Zealand	Quantitative randomized, open label trial; Māori Peoples; (n = 256/513, 50 %), 54 primary healthcare centers	1. Innovative Drug Formulation	1. Clinical	1. Patient 2. Practice
Managing Medicines				
McRae et al., 2008, Australia	Mixed methods program evaluation, questionnaire, 3-phase survey, semi structured interviews; Aboriginal Health Workers; (n = 47), 10 localities	1. Health literacy	1. Humanistic	1. Patient 2. Practice
Gaspard et al., 2021, Canada	Quantitative program evaluation; Canadian First Nations Peoples; (n = 4000 Elders)	1. Health literacy	1. Humanistic	1. Patient 2. Practice 3. Community
Walke et al., 2022, Australia	Mixed methods approach, questionnaire and focus groups; Aboriginal Peoples; (n = 30) community-dwelling	1. Dose administration aids	1. Humanistic	1. Patient 2. Practice 3. Community
Navin et al., 2021, US	Quantitative retrospective analysis; American Indian and Alaska Native Peoples; (n = 25) one IHS facility	1. Dose administration aids	1. Clinical	1. Patient 2. Practice

Table 2
Strategies and interventions mapped to Kiles et al.²⁵ framework.

	Patient			Practice			Community		
	Culturally sensitive patient education	Medication affordability	Medication adherence interventions	Primary prevention strategies	Social needs screening and referral	Interprofessional collaboration	Community engagement	Community needs assessment and planning	Political advocacy
Deidun et al.,	x		x	x		x			
Drovandi et al.,	x		x	x		x			
Duck, B.,				x		x		x	
Swain L., Barclay L., 2015a			x	x		x	x		
Swain L., Barclay L., 2015b			x	x			x		x
Deming et al.,	x		x	x		x			
Duvivier et al.,	x			x		x	x		x
Gallegos et al.,		x	x	x		x		x	x
Geiger et al.,	x		x	x		x			
Martin et al.,	x		x	x		x	x	x	
Lawrence et al.,	x		x	x		x			
O'Connell et al., 2022	x		x	x		x		x	x
O'Connell et al., 2021	x		x	x		x			x
dos Santos M.,				x				x	x
Pett et al.,			x	x		x			
Rose J.L.,				x					
Weston-Buffalohead J.M.,	x		x	x		x	x		x
Harrop et al.,	x	x	x	x		x	x		
Moore et al.,	x		x	x		x			x
Hikaka et al., 2021a	x		x	x		x			
Hikaka et al., 2021b	x		x	x		x			
Erker et al.,	x		x	x		x	x		
Mitchell et al.,		x	x	x		x			x
Trivedi et al., 2017		x							x
Trivedi et al., 2020		x							x
Kelagher et al.,		x		x		x			x
The Senate.,		x	x			x			x
Patel et al.,		x	x	x					
Pilcher et al.,			x	x					
Selak et al.,		x	x	x					
Liu et al.,		x	x						
Walke et al.,		x	x	x			x		x
Navin et al.,			x	x					
McRae et al.,	x			x		x			
Gaspard et al.,	x			x		x	x	x	
Rick et al.,			x	x		x		x	

a retail pharmacy setting. The two reported hospital studies related to one intervention and incorporated hospital/community transition.^{40,53}

3.1. Strategies and interventions

Reported strategies and interventions, contributing to achieving First Peoples health equity, were organized into three groups: Clinical pharmacy practice, medicines access, and managing medicines. As described in the protocol,⁸ strategies and interventions may be multi-faceted, therefore where strategies and interventions had more than one commonality, the predominant one was chosen for grouping. Important aspects of the 36 studies are described below including reported outcomes and how impact was measured.

3.1.1. Clinical pharmacy practice

Clinical pharmacy practice was reported as a strategy in 22 studies (61%)^{1,7,32–39,41,43–45,48,49,53,55,59,60,62,63} with medication review and/or medication optimization reported in all 22 studies. Additional strategies or interventions were reported in 12 of the 22 studies^{7,32,33,35–37,41,43–45,48,49} and consisted of pharmacy-led chronic disease clinics,^{35,41,45} use of telepharmacy,^{7,35–37,49} innovative partnerships,^{7,48} and advanced pharmacy practice,^{7,32,33,35–37,43,44} inclusive of case-management.^{32,35–37,43} Development and implementation of culturally appropriate pharmaceutical care models was reported in ten of the 22 studies,^{33,38,39,48,53,55,59,60,62,63} and 12 studies reported evaluations of services delivered in culturally appropriate settings.^{1,7,32,34–37,}

^{41,43–45,49} Chronic disease was targeted in eleven of the studies, inclusive of the opioid epidemic,³⁶ hepatitis C,^{35,37} diabetes,^{32,41,43,48} cardiovascular disease,^{32,33,43,44} asthma,⁴⁵ and gout.³⁹

The measured impact fitted into the ECHO model categories³⁰ for all except one of the 22 studies which utilized SDOH⁴⁴ as shown in Table 1. In this group, two studies reported economic outcomes,^{7,49} measuring the financial impact on health services; with cost savings derived from remote pharmacist oversight via video-conferencing^{7,49} and an innovative collaborative partnership shared federal government resource such as software and personnel.⁷

Clinical outcomes were reported in 17 of the 22 studies^{1,7,32–34,36–39,41,43–45,48,49,53,55} and classified here as health service outcomes, patient health outcomes and process outcomes; one study reported a workforce outcome, the number of first responders trained by pharmacists to manage opioid overdose.³⁶ Health service outcomes comprised reductions in emergency department (ED) visits,^{43,45} and hospitalizations,^{43,45} and were reported as statistically significant. These included lowered odds of 1 or more hospitalizations (OR = 0.80, p = 0.001)⁴³ and lower number of ED visits (−0.08, p < 0.01),⁴³ overall reductions in hospitalizations and ED visits 12 months pre and post intervention (p = 0.02 for both),⁴⁵ as well as reduction in unplanned cardiac readmissions to hospital at 90 days post-intervention (64 of 199 vs 21 of 119; 0.55, 0.35–0.85; p = 0.0060).⁵³

Patient health outcomes comprised stability of health conditions⁵⁵ or improvement of chronic disease markers; namely reductions in glycated haemoglobin (HbA1c),^{32,41,48} body mass index (BMI),⁴⁸ systolic blood

Table 3
Inductive content analysis of barriers and enablers to implementation of strategies and interventions.

BARRIERS		
Level	Theme	Code
Patient	Disengagement	Limited trust, ^{59,60,62} poor health literacy, ^{41,45,53,56,57,60} disempowerment, ^{34,41,42,45,53,60} pill burden, ⁶⁵ transient living ³²
Practice (system)	Social determinants of health	Transport ^{37,60} /distance ⁴⁴ /household income ^{34,44,45,61}
	Workforce	Racial stereotyping ⁵⁹ Non-collaboration between health professionals ⁵⁹ Inadequate pharmacist competencies ⁵⁹ (patient-centred care, communication & lack of specialization) ⁶¹ Staff shortages ⁶¹ and limited trained First Peoples personnel ^{56,61}
	Healthcare systems	Complex, fragmented and inflexible systems, ^{7,32,56,59–61,63} health service readiness, ^{32,59,61,63} inadequate data collection (program evaluation) ⁵⁶
	Pharmacy services	Deficient technology ⁵⁷ and services not available (pharmacy deserts), ^{56,61} inadequate resource, ^{37,40,42,56,61,63,64} unsustainable (rural and remote), ^{56,63}
Community	Authentic community partnerships	A lack of community engagement ⁶⁰ and input, ⁴¹ trust and relationship building ^{41,56,59–61,63}
ENABLERS		
Content Category	Subcategory	Code
Patient	Empowerment	Health literacy, ^{1,32,44,53,56,57,59,60} peer or family support, ^{48,60,62} medication aids and subsidies, ^{40,42,47,51–53,56,58,61,65} reduced pill burden & care coordination ⁵³ (transport), ^{35,44} First Peoples leadership ^{57,62}
Practice (system)	Authentic patient-practitioner partnerships	Patient-centred care ^{38,53,60,62} with cultural mentoring, ⁵⁹ two-way learning & trust ^{1,40,57,59,60,62,63}
	Health service readiness	Flexible approach, ^{32,38,41,47,56,58,60} service redesign, ^{7,33,40,53,54,56,60,61} innovative partnerships, ^{7,48,56,64} adequate resource, ⁶⁰ resource sharing, ^{7,48,56} and service evaluation (directing resource), ^{43,44,54} technology in place and utilized, ^{7,35,37,44,49} access to a clinical pharmacist ^{33,45,54–56,60,62} including pharmacists and other personnel self-identifying as First Peoples, ^{34,38–40,56,60,62,63} advanced pharmacy practice in place ^{32,33,35–37,43,44}
	Advanced practice pharmacists	Pharmacists working at full scope ^{32,33,38,44} with high level leadership and communication skills, ^{35,41} and embedded into the interprofessional team ^{1,7,32,33,36,39,41,45,48,53,56,59}
Community	Community engagement	Culturally appropriate models of care ^{1,32,34,38,39,53,55,56,59,60,62,63} including research, ^{46,47,50,58} relationship building ^{1,41,48} , ^{59,60,63–65} and consultation ^{36,41,46,50,53,56,59,60}

pressure (SBP),^{32,33,43} low-density lipoprotein (LDL) cholesterol,⁴³ sustained virological clearance (SRV),³⁷ and serum urate level post gout intervention.³⁹ Outcomes reported as statistically significant included reductions in HbA1c, (n = 18, p = 0.004),⁴¹ (n = 135, p = 0.004),⁴⁸ (n = 2259, p < 0.001),³² BMI (n = 135, p = 0.003)⁴⁸ and lower odds of LDL cholesterol respectively (OR = 0.89, P < 0.01),⁴³ (5.29 mg/dL, p < 0.001).³² Lowered odds of high (OR = 0.85, p < 0.001)⁴³ or lowered SBP, (p = 0.01)³² were reported, as well as lowered onset odds of CVD (OR 0.79, p = 0.05),⁴³ or end-stage renal disease (OR = 0.60, p < 0.05).⁴³ SDOH, namely lower household income and increased travel distance to services, lowered the odds of patients accessing clinical pharmacy services (OR = 0.72; 95 % CI: 0.56–0.93) and (OR = 0.87; 95 % CI: 0.83–0.92) respectively⁴⁴; with lowered odds of elevated SBP reported for clinical pharmacy users (OR = 0.71 95 % CI: 0.58–0.87).⁴⁴

Process outcomes included pharmacist reviews,⁴⁹ pharmacist recommendations to and uptake by the prescriber,^{34,38} prescriptions dispensed^{49,55} as well as prescriptions refilled.¹ Advanced pharmacy practice process outcomes constituted measuring numbers of collaborative practice agreements (CPA's),^{35–37,43,44} collaborative drug therapy management (CDTM) protocols,⁷ or pharmacist case presentations and treatment recommendations.³⁵

Humanistic outcomes, reported in 12 of the 22 studies,^{1,7,34,36,38,39,41,48,59,60,62,63} were either patient and/or healthcare providers experience and/or acceptability of the intervention or strategy; namely perceived empowerment of patients with their healthcare and medications, promoting adherence,^{1,34,41,59,60,62,63} and patient trust in the pharmacist facilitated by relationship building.^{1,62} Where collected, patients rated their experience of pharmacy practice strategies and interventions, as excellent or very good.^{39,41}

3.1.2. Medicines access

Strategies or interventions, related to medicines access, were reported in ten studies^{40,46,47,50–52,54,56,58,61}; six were evaluations of financial programs and initiatives,^{40,51,52,54,56,61} and four were RCTs testing innovative drug formulations designed to increase preventative medication use.^{46,47,50,58} Of the six program evaluations five were

Australian,^{40,51,52,54,56,61} and the sixth was a Brazilian study, evaluating the First Peoples Pharmaceutical Assistance Management Model, a quality use of medicines (QUM) program.⁵⁴ Measured impact for the ten studies^{40,46,47,50–52,54,56,58,61} fitted into the ECHO model³⁰ categories as shown in Table 1.

Of the five Australian evaluation studies, four reported economic outcomes^{40,52,56,61} consisting of changes in patient⁵² and healthcare expenditure^{40,61} along with an increase in medicine utilization^{52,56,61}; a relative increase of 39 % in medication usage and a 61 % decrease in out of pocket expenses, post intervention, was reported in one study.⁵² Clinical outcomes were reported in one of these five studies, a national medication subsidy,⁵¹ comprising a marked decline in hospitalizations for a variety of chronic disease conditions post intervention⁵¹; two of the five studies reported humanistic outcomes,^{56,61} consisting of comprehensive healthcare provider feedback utilized for future program modifications.^{56,61}

The Brazilian evaluation study⁵⁴ utilized changes in population data, medicine expenditure and total national healthcare expenditure pre and post intervention; major cost savings, through medication rationalization and increased access to traditional medicine were reported.⁵⁴

Clinical outcomes were reported in three of the RCT studies^{46,47,50}; one RCT, investigating a combination asthma inhaler,⁴⁶ reported an overuse of medication compared to control group, indicating higher asthma exacerbations and poorer clinical outcomes for First Peoples. For two of the three RCTs, both investigating a CVD polypill,^{47,50} self-reported medication adherence as assessed by a trial nurse was utilized, and both reported an increase in medication usage^{47,50}; one of the CVD polypill RCTs used SBP and cholesterol levels to measure impact but no change post intervention was reported.⁴⁷ The third CVD polypill RCT, a qualitative evaluation, reported humanistic outcomes⁵⁸, with patients and providers finding the polypill acceptable however providers reported inflexibility for patients on complex medication regimens.⁵⁸

3.1.3. Managing medicines

Strategies or interventions relating to patients managing their

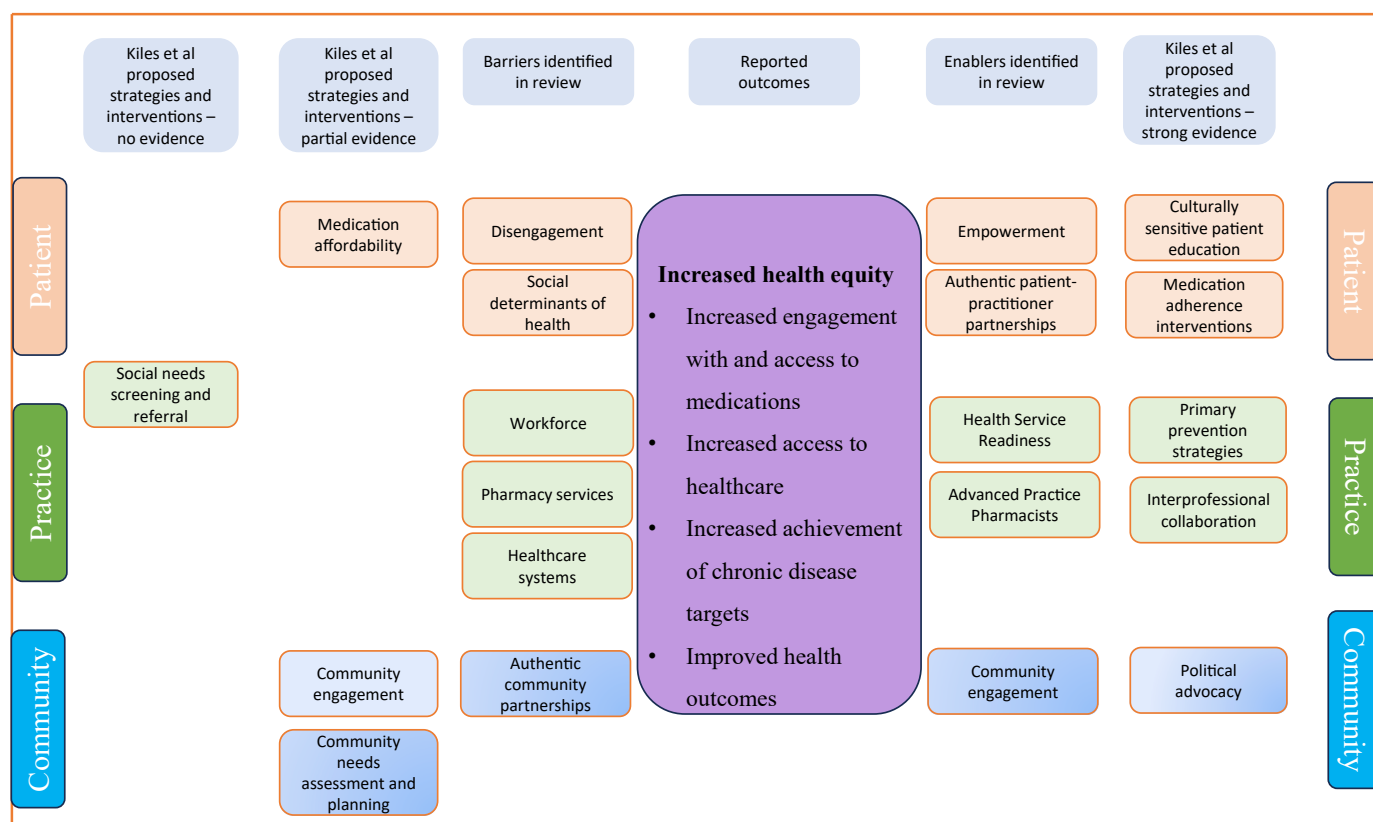


Fig. 3. Combined review outputs.

medicines were reported in four studies ($n = 4$, 13 %).^{42,57,64,65} Two studies reported on the use of dose administration aids (DAA's)^{42,65}, and two studies reported health literacy initiatives, one a polypharmacy intervention for consumers and their healthcare professionals⁵⁷ and the other a medicines education program for First Peoples Health Workers.⁶⁴ Measured impact for the four studies fitted the ECHO model³⁰ categories as shown in Table 1; however no economic outcomes were reported. A clinical outcome was reported for one DAA study⁴²; the change in medication possession ratio, a measure of adherence, with a significant increase from 67.4 % to 86.0 % ($P < 0.001$) post 12 months intervention demonstrated.⁴² Humanistic outcomes were utilized for one DAA study which reported DAA's as important for managing medications and building a patient-pharmacist relationship⁶⁵; humanistic outcomes for the health literacy initiatives captured patient or healthcare providers experience and acceptability.^{57,64} Upskilling First Peoples Health Workers on CVD, by community pharmacists, was reported as highly acceptable with relationship building stated as a genuine benefit.⁶⁴

3.2. Mapping to the Kiles et al.²⁵ framework

Strategies and interventions were mapped at a patient, practice (system) and community level to the Kiles et al.²⁵ framework enabling identification of potential evidence gaps⁸; studies were mapped to more than one element as appropriate, with results shown in Table 2 and described below.

3.2.1. Patient level

From the reported 36 studies, 33 (92 %) mapped at the patient level; of which 27 specifically addressed (82 %) medication adherence,^{1,7,32,34,35,37–48,50,53,55,56,58–60,62,63,65} 17 studies (52 %) mapped to culturally sensitive patient education,^{1,32,34–39,41,43–45,53,55,57,62,63} and 11 studies (33 %) mapped to medication affordability.^{7,40,47,50–53,56,58,61,65}

3.2.2. Practice (system) level

At the practice (system) level, 32 (89 %) of the reported 36 studies mapped to primary prevention strategies,^{1,7,32–50,53–55,57,59–65} 26 studies (79 %) mapped to interprofessional collaboration,^{1,7,32–41,43–45,48,53,55–57,59–64} and no studies (0 %) mapped to social needs screening and referral.

3.2.3. Community level

For the reported 36 studies, 22 (61 %) mapped at the community level; ten of these studies (46 %) mapped to community engagement,^{1,36,38,41,53,55,57,59,60,65} eight studies (36 %) mapped to community needs assessment and planning,^{7,33,41,44,48,54,57,61} and 16 studies (73 %) mapped to political advocacy.^{7,32,36,38,40,43,44,51,52,54–56,59–61,65}

3.3. Barriers and enablers

A simple inductive content analysis was undertaken on reported implementation barriers and enablers with themes aligned to the Kiles et al.²⁵ framework levels; analysis outputs, inclusive of levels, themes and codes are detailed in Table 3. The two main barriers at patient level were disengagement and social determinants of health, with poor health literacy,^{41,45,53,56,57,60} and disempowerment,^{34,41,42,45,53,60} most frequently reported as reasons for patient disengagement; the most commonly reported barriers relating to SDOH were transport,^{37,60} and household income.^{34,44,45,61} The majority of barriers were reported at the practice (system) level with the most predominant being inadequate resources for pharmacy services,^{37,40,42,56,61,63,64} and complex, fragmented and inflexible healthcare systems.^{7,32,56,59–61,63} Whilst barriers such as workforce, healthcare systems, and authentic community partnerships were also reported at the practice (system) level they were not as prevalent. The most frequently reported barrier at the community level was lack of trust and relationship building.^{41,56,59–61,63}

Conversely, the main patient level enabler themes were empowerment and authentic patient-practitioner partnerships; most frequently reported enablers were health literacy,^{1,32,44,53,56,57,59,60} along with medication aids and subsidies.^{40,42,47,51–53,56,58,61,65} As with the barriers, most enabler themes related to the practice (system) level; advanced practice pharmacists embedded in the interprofessional team was the predominantly reported enabler.^{1,7,32,33,36,39,41,45,48,53,56,59} Many other enablers, reported in almost equal amounts, included advanced pharmacy practice in place,^{32,33,35–37,43,44} a flexible approach,^{32,38,41,47,56,58,60} service re-design,^{7,33,40,53,54,56,60,61} and access to a clinical pharmacist,^{33,45,54–56,60,62} preferably one self-identifying as First Peoples.^{34,38–40,56,60,62,63} The prominent theme at the community level was community engagement with the most reported enabler being culturally appropriate models of care^{1,32,34,38,39,53,55,56,59,60,62,63}; followed closely by relationship building,^{1,41,48,59,60,63–65} and consultation.^{36,41,46,50,53,56,59,60}

To highlight alignment in the results, the authors have combined review outputs; namely strategies and interventions, Kiles et al.²⁵ mapping, reported outcomes, along with barrier and enabler themes as shown in Fig. 3. Presentation of the results in this way clearly accentuates evidence was reported against selective enablers for pharmacy practice's contribution to achieving First Peoples health equity; and limited or no evidence was reported against barrier themes.

4. Discussion

The results of this review offer a detailed overview of current pharmacy practice strategies and interventions, implemented across the

globe, to address First Peoples health equity. This is important because health system transformation, which acknowledges and enables First Peoples leadership, self-determination and empowerment is urgently required to achieve First Peoples health equity^{61,66}; and pharmacists are recognized as leaders in health system transformation as agents of change.^{15,24} Our review further builds on the work of Fazelpour et al.,⁵ by demonstrating the significant impact advanced pharmacy practice, leadership and innovation can have on improving First Peoples access to care and clinical outcomes. The results highlight the full potential of pharmacy practice as well as revealing where increased attention is required by the profession, particularly at the community level.

4.1. Strategies and interventions

There were major differences between the US and Australia in the types of strategies and interventions reported; the US studies reported almost exclusively on clinical pharmacy practice (n = 12)^{7,32,35–37,41,43–45,48,49,55} and the Australian studies reported primarily on medicines access (n = 7),^{40,47,51,52,56,58,61} followed by clinical pharmacy practice (n = 5).^{34,53,59,60,63}

In the clinical pharmacy practice group, the US studies, (n = 12)^{7,32,35–37,41,43–45,48,49,55} primarily emanated from within the Indian Health Service⁶⁷ (IHS) (n = 9)^{32,35–37,41,43–45,49}; and predominantly reported additional strategies or interventions (n = 11)^{7,32,35–37,41,43–45,48,49} showcasing advanced pharmacy practice,^{7,32,33,35–37,43,44} pharmacy leadership,^{32,35–37,41,43–45} and innovation.^{7,35–37,48,49} The US studies targeted chronic diseases ranging from hepatitis C,^{35,37} diabetes,^{32,41,43,48} CVD,^{32,43,44} asthma⁴⁵ and the

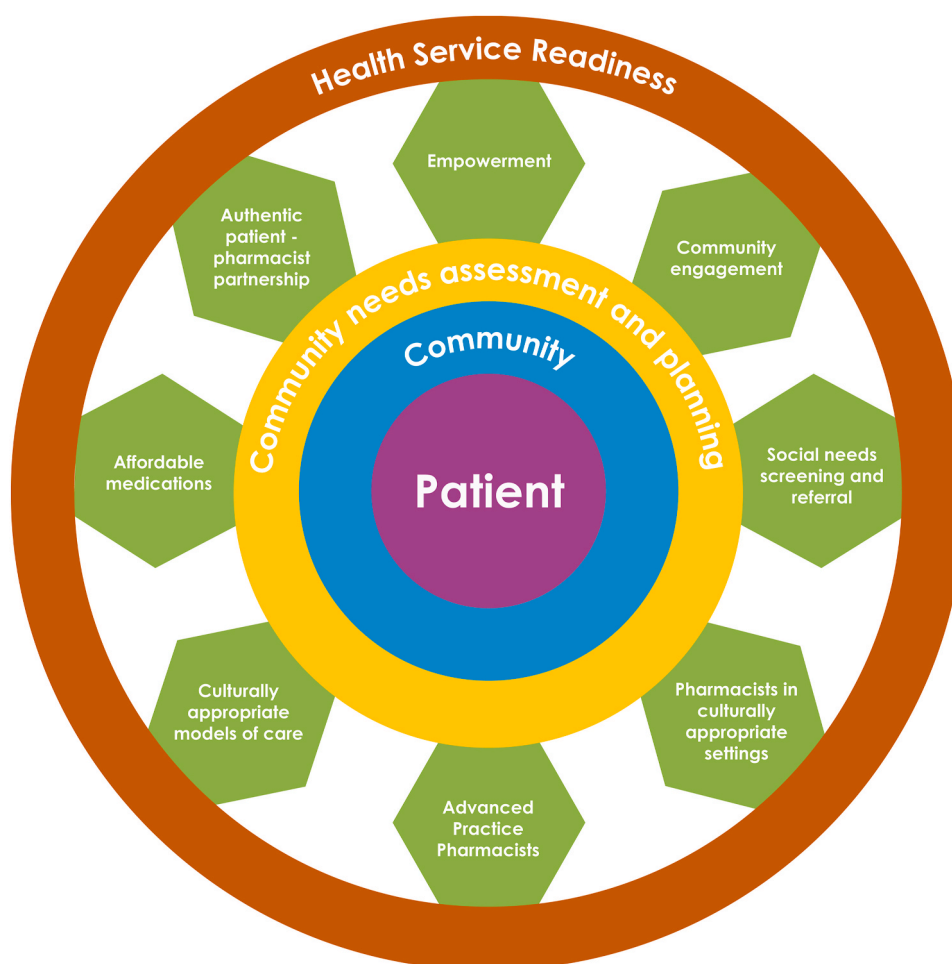


Fig. 4. An ideal model for maximising the contribution of pharmacy practice to First Peoples health equity.

opioid endemic³⁶ reporting statistically significant clinical outcomes, for both health service and patient.^{32,41,43,45,48} In addition, aggregated service evaluation data,^{32,43,44} demonstrated positive effects of US pharmaceutical care models showing a direct correlation between advanced pharmacy practice and improved clinical outcomes^{32,43}; this is supported by the 2019 United States Public Health Service National Clinical Pharmacy Specialist Committee report.⁶⁸

Clinical pharmacy practice strategies and interventions comprised of clinical pharmacists fully integrated within the interprofessional team^{32,33,35–37,41,43–45,49,53}, including advanced practice pharmacists.^{32,33,35–37,43,44} The settings for these studies were within a variety of culturally appropriate primary healthcare services, where the model of care valued relationship building to support patient trust in pharmaceutical care and pharmacy practice.^{1,34,60,62,63} In this review, the hospital intervention reported no humanistic outcomes^{40,53}; First Peoples voices in regard to medications or pharmaceutical care were not reported in these studies. These results align with the review by Fazelipour et al.⁵ where there was limited evidence of culturally appropriate clinical pharmacy services and pharmaceutical care models within hospitals and across the transitions of care. As hospitals are vital in provision of healthcare, and transitions between primary and tertiary settings are particularly vulnerable points in patients care,⁶⁹ developing strategies that encompass all healthcare settings would seem essential to progress First Peoples health equity.

Regardless of setting and area of practice, pharmacists need to provide culturally-competent, patient-centred pharmaceutical care; including the ability to understand First Peoples circumstances in terms of language, health literacy and education and this is seen as vital to achieving First Peoples health equity.^{5,26,70} There is a growing movement to embed cultural safety into pharmacy practice through university curriculum to ensure delivery of culturally appropriate clinical services; with momentum building in Australia through the Leaders in Indigenous Pharmacy Profession Education (LIPPE) network⁷¹ and evidence from Canada found during this review process.^{5,72,73}

In the context of medicines access, of the six studies evaluating financial programs, only two demonstrated decreased hospitalizations⁵¹ and improvement of chronic disease outcomes⁵²; perhaps due to the theory that improved health outcomes are dependent on the efficacy of the medicine not the increase in access to it.⁶¹ Medicine affordability is an important factor for consideration in achieving First Peoples health equity,^{74,75} with it identified as the single biggest barrier for First Peoples medicines access,⁶¹ however it is known that financial programs on their own are not enough to increase access and improve health outcomes.^{56,61,74} In this review, innovative partnerships,^{7,36,48} redesigning service provision⁷ and the sharing of resource,^{7,48} are shown as important strategies and interventions to decrease fragmentation of funding programs and increase medicines access as a means to increasing First Peoples health equity.

It is worth noting, with the RCT studies, not all RCT trial participants were First Peoples however as a strategy to promote equity, all included First Peoples and utilized specific First Peoples enrolment strategies; such as adding a 5 % increment to the Framingham risk equation,^{47,50,76} using lower thresholds, oversampling and recruiting via First Peoples primary healthcare services.^{47,50}

In reference to managing medications, patient and interprofessional education is very much within pharmacists scope and would be an included activity in reported clinical pharmacy strategies and interventions in this review^{1,7,34–39,41,43–45,49,55,59,62,63}; the studies by McRae⁶⁴ and Gaspard et al.⁵⁷ though, depict examples of enhancing health professional and patient education, through augmenting First Peoples empowerment. These strategies and interventions facilitate building the necessary relationships and trust between First Peoples and health professionals, a vital requirement for achieving First Peoples health equity.^{5,70}

4.1.1. Measuring impact

Of the 36 reported studies one study stated outcomes against all three dimensions⁷ of the ECHO model³⁰; the majority of studies reported only against clinical outcomes. One study did utilize SDOH, measuring SDOH impact on accessing pharmacy services which demonstrated decreased potential for positive clinical outcomes⁴⁴; however the ECHO model³⁰ does not encompass measuring for health equity. It is acknowledged that the measurement of health equity poses a challenge⁷⁷ and with increased emphasis on achieving health equity on the global scale,⁷⁸ organizations are making headway with tools and strategies for measurement.^{77,79} If pharmacy practice is to address the SDOH⁸⁰ and upstream factors, a future focus must be on determining how to measure the valuable contribution of pharmacy practice on health equity agendas²⁵; extending the ECHO model³⁰ to include health equity outcome measures could be a pragmatic approach to this identified gap. Of future importance is the concept of sustainable health equity which has been proposed as an ethical principle underlying global policies⁸¹; applying the lens of scalability and sustainability to pharmacy practice strategies and interventions, identified as contributing to First Peoples health equity is warranted.

4.2. Pharmacy practice gaps

There are many health equity frameworks through the lens of which the results of this review could be viewed, such as the WHO's influential 'conceptual framework for action on the social determinants of health'⁸²; however the Kiles et al.²⁵ framework was chosen because of its unique specificity to pharmacy practice.⁸ Strengthening health systems through addressing health equity requires more than improving health service delivery itself,⁸³ structural determinants as well as social determinants are involved; and health equity frameworks require translation into practice.⁸³ The Kiles et al.²⁵ framework, as it is used in this review, facilitates understanding of the current interactions between pharmacy practice, health systems and the SDOH. Utilizing the Kiles et al.²⁵ framework, to map the review evidence has clearly identified the gaps for pharmacy practice in relation to achieving First Peoples health equity; the combination of result outputs (Fig. 3), sets the evidence so as to emphasize these gaps for the reader.

As highlighted in Fig. 3 there is robust evidence at the patient level with 75 % of the reported studies mapping to medication adherence; this befits the focus of clinical pharmacy practice, however only 47 % studies mapped to culturally sensitive patient education and 31 % to medication affordability. As shown with the barriers identified in this review and in the wider evidence, First Peoples can experience inordinate barriers impacting on medication adherence,⁸⁴ such as medication affordability⁸⁵ and unfavorable healthcare interactions^{85,86}; medication adherence cannot be addressed in isolation, strategies and interventions require a holistic approach as highlighted by Levesque et al.⁸⁵ and demonstrated in the reported study by Harrop et al.⁵³

A major gap highlighted by results mapped at the practice (system) level, and illustrated in Fig. 3, is the total absence of evidence pertaining to social needs screening and referral; primary prevention and inter-professional collaboration present as strengths of pharmacy practice, yet there were no reported studies mapped to social needs screening and referral. SDOH significantly impact First Peoples access to clinical pharmacy services; as identified through barriers in this review, in the reported study by O'Connell et al.,⁴⁴ along with broader evidence showing SDOH directly affects a patient's adherence to their medication regimen.⁸⁴ Therefore, social needs screening and referral could be considered an integral component of pharmaceutical care and pharmacy practice. In addition, pharmacists are frequently the first healthcare encounter for patients due to their accessibility in the primary care sector⁵ and are ideally placed for tackling upstream engenders of health inequities,⁸⁷ indeed evidence is emerging informing how the pharmacy profession can address the SDOH.^{88,89} Increasing the scope of pharmacy practice to respond to patient's social needs is critical in addressing

health inequities.^{15,24,25,80}

Whilst pharmacy practice deserves applause for its political advocacy, evident from reported studies utilizing data to demonstrate improved health outcomes,^{7,36,40,43,44,51,52,56,61} much more effort is required at the community level. Utilizing the combined review outputs (Fig. 3) the authors offer an ideal model, as shown in Fig. 4, for maximising the contribution of pharmacy practice to achieving First Peoples health equity. First Peoples world view and ways of knowledge are imperative to the development and delivery of their health services³⁰; and as shown in Fig. 4, community-centred care is as important to First Peoples as patient-centred care. Understanding community positioning and identifying areas of strength provides a starting platform from which to increase access to medicines and pharmaceutical care.^{24,44} In this review, reported studies, mapped to community needs assessment and planning, clearly demonstrate how building partnerships and increasing understanding of community leads to novel strategies and interventions.^{7,41,44,48,54,57} It is through community understanding along with long-term community relationships that the sustainability and scalability of strategies and interventions, a requisite for health equity, will be attained.^{81,91}

It is known that First Peoples experience greater barriers to accessing healthcare than non-First Peoples, with challenges caused not only by social determinants but also structural determinants such as discrimination and racism.^{20,74} Access to healthcare is a human right,⁹² yet barriers across all levels of the health system were identified in this review; pharmacy practice can shape and influence all of these implementation barriers, increasing access to medications and pharmaceutical care, with evidence emerging to support the profession in this endeavour.^{24–26} Enablers to successful implementation are pharmacists working to their full scope of practice, advanced practice pharmacists, embedded within interprofessional healthcare teams; fully equipped with the necessary communication and leadership skills. Communication skills which incorporate learning on bias,^{5,24} anti-racism,⁹³ and trauma informed care,⁵ enabling pharmacists to be able to build the required trust and authentic partnerships⁷⁰; as well as leadership skills enabling pharmacy practitioners to build the necessary relationships at community level and to lead the required transformative change.

A major identified enabler was health service readiness; this is defined as a health system's ability to rapidly adapt policies, operations and practices to allow for incorporation of innovative approaches to care.⁹⁴ In this review, health service readiness included a flexible approach, innovative partnerships and sharing of resource, utilization of service evaluation to direct resource as well as having technology in place and utilized. When patient factors, such as health status and resources, cannot be changed, health service readiness, i.e., pharmacy practice adapting and responding, becomes imperative to enable the change required to facilitate (First Peoples) health equity.²⁶

4.3. Future research

This review has identified pharmacists need to be practicing at full scope and delivering advanced pharmacy practice services to wholly contribute to achieving First Peoples health equity. In Australia, New Zealand, Canada, and the US this requires policy and legislative changes to ensure consistency of access,⁹⁵ as well as appropriate training and development for pharmacists.¹³ Future studies are necessary to drive and measure the impact of these changes for pharmacy practice including pharmacist knowledge of structural and SDOH and competencies, particularly high level leadership and communication skills. Areas for research focus are the intersection of structural and SDOH with pharmacy practice, a priority being the integration of social needs screening into pharmacy practice. This is a recognized focus with Marmot et al.⁹⁶ placing a strong emphasis on including SDOH in public health research agendas. The inclusion of social elements into pharmaceutical care is an important future focus for research as well as defining

a medication systems approach to First Peoples health equity, outside of patient factors.²⁶ Determining how to measure pharmacy practice impact on health equity including developing standardized outcomes measures for health equity interventions is also required. This review further adds to evidence highlighting the need to understand and evaluate pharmacy practice related to First Peoples in the hospital setting⁹⁷ and across transitions of care.

4.4. Limitations

It is acknowledged this review may have limitations; despite the use of robust methodologies there may be a subjective element in the mapping of strategies and interventions as well as in the inductive content analysis. This was a global review however the thirty-six included articles originated from only five countries: US, Australia, New Zealand, Canada, and Brazil. Of note is the lack of studies from regions such as Asia and Africa; whilst this is complex and may involve issues such as government denied acknowledgement of Indigeneity,^{98,99} pharmacy practice in low-and middle income countries, for both First Peoples and non-First Peoples, faces major barriers to optimal delivery of pharmaceutical care.¹⁰⁰ These barriers, which include both health system and pharmacist practitioner,¹⁰⁰ highlight health inequities across countries; and they could explain why the other 85 countries with First Peoples¹⁶ have not met the inclusion criteria and international definition used in this review.²⁹ For example in low-middle income countries, activities such as clinical pharmacy and practice-based research may not currently be as high a priority as pharmacists facilitating access to essential medicines^{101,102}; a set of recommendations to improve pharmacy practice, increasing pharmacy equity in low-and middle income countries has been proposed.¹⁰³

The majority of the research team are non-First Peoples and their approach from a western world view may be a limitation. First Peoples interpretations have been centred through sustained engagement and ongoing advice from the research team's cultural advisor; the team meets every fortnight to reflect and discuss all aspects of the research. The authors who are non-First Peoples have spent many years working with and developing relationships with First Peoples and are committed to reflexive practice.

5. Conclusion

This review demonstrates how pharmacy practice increases First Peoples health equity by enabling engagement with and access to medications, increasing access to healthcare, enabling patients to meet chronic disease targets, and improving health outcomes. Culturally appropriate, innovative, and flexible, advanced pharmacy practice models of care, incorporating First Peoples social requirements, is urgently required across all settings. Pharmacists with high level communication and leadership skills as well as an understanding of First Peoples health determinants is requisite to building empowering authentic patient-practitioner partnerships, increase engagement with communities and lead transformative change.

CRedit authorship contribution statement

Michelle Rothwell: Writing – review & editing, Writing – original draft, Visualization, Resources, Project administration, Methodology, Investigation, Funding acquisition, Formal analysis, Data curation, Conceptualization. **Karen Carlisle:** Writing – review & editing, Visualization, Supervision, Methodology, Formal analysis, Conceptualization. **Alice Cairns:** Writing – review & editing, Visualization, Supervision, Methodology, Conceptualization. **Valda Wallace:** Writing – review & editing, Validation, Methodology, Conceptualization. **Karl McDermott:** Writing – review & editing, Methodology, Formal analysis, Data curation.

Ethics approval and consent to participate

This work has ethics approval from the Far North Queensland Human Research Ethics Committee (FNQ HREC). Reference HREC/2024/QCH/105619 (May ver 5) – 1799.

Consent for publication

Not applicable.

Availability of data and materials

The datasets generated and/or analyzed during the current study are available in the Research Data JCU repository and can be accessed at <https://doi.org/10.25903/4p65-bg76>.

Use of artificial intelligence

The authors declare there has been no use of artificial intelligence during this review or for the development of the manuscript.

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Declaration of competing interests

The authors declare they have no competing interests.

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Glossary

CVD	Cardiovascular Disease
WHO	World Health Organization
SDOH	Social Determinants of Health
SES	Socioeconomic Status
PRISM-ScR	Preferred Reporting Items for Systematic Reviews and Meta-Analyses extension for Scoping Reviews
ECHO	Economical, Clinical and Humanistic Outcomes
RCTs	Randomized Controlled Trials
US:	United States of America
IHS	Indian Health Service
ED	Emergency Department
HbA1c	Glycated Haemoglobin
BMI	Body Mass Index
SBP	Systolic Blood Pressure
LDL:	Low-Density Lipoprotein
SRV	sustained virological clearance
CPA's	Collaborative Practice Agreements
CDTM	Collaborative Drug Therapy Management
DAA's	Dose Administration Aids
LIPPE	Leaders in Indigenous Pharmacy Profession Education

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