

## REVIEW

# Scoping review – What do we know about Aboriginal peoples' use of dose administration aids?

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## Abstract

**Issue addressed:** This paper aims to report findings of a scoping review which mapped and summarised available literature regarding Aboriginal peoples' use of Dose Administration Aids (DAAs) for improved medication management.

Aboriginal and Torres Strait Islander peoples have higher rates of chronic disease than other Australians. This leads to increased numbers of prescribed medications and complex medication taking regimens. The Australian Government and Pharmacy Bodies provide programs for Aboriginal peoples with chronic conditions, including programs supporting access to DAAs to improve medication adherence.

**Methods:** The search strings used included three key concepts: Indigeneity; DAAs and outcomes. PubMed, Medline via Ovid and the grey literature were searched.

**Results:** After removal of duplicates, 426 papers were screened by title and abstract for inclusion. A further 407 papers were then excluded leaving a total of nineteen papers included in the review. Only three of these papers included all three concepts in the search criteria, and none of these were empirical studies.

**Conclusion:** The lack of studies found in this review support the requirement for empirical research regarding the effects of DAAs on medication taking behaviours of Aboriginal people, and the programs that provide them.

**So What?:** The Australian Government funds programs that provides access to DAAs as a method of improving medication taking behaviours. But what do we really know about DAAs and if or how they assist in this goal? This review scopes out what is known, in order to direct studies that will answer this question.

## KEYWORDS

Aboriginal and Torres Strait Islanders, chronic disease, health behaviours

## 1 | INTRODUCTION

Aboriginal and Torres Strait Islander peoples Aboriginal and Torres Strait Islander peoples have a shorter life expectancy than that of non-Indigenous Australians.<sup>1-3</sup> It is important to acknowledge the

ongoing impact of colonisation on the considerable disadvantage experienced in this population and the associated health disparities.<sup>4,5</sup>

The impacts of colonisation include transgenerational/intergenerational trauma from the effects of the stolen generation, assimilation, forced denial of identity, lack of access to culturally appropriate and

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safe care, experiences of racism personally and systemically, all of which have led to lower socio-economic status, and have had a negative impact on the health status of many Indigenous Australians.<sup>6,7</sup>

It has been estimated 80% of the disparity in life expectancy is due to chronic disease, increasing the morbidity of, and shortening life.<sup>8</sup> In 2013, 33% of Aboriginal and Torres Strait Islander peoples Aboriginal and Torres Strait Islander peoples reported they had three or more chronic health conditions compared to 23% of Australians reporting two or more chronic conditions.<sup>1,9</sup>

Experiencing multiple chronic diseases is associated with complex medication regimens.<sup>10,11</sup> Aboriginal and Torres Strait Islander peoples with chronic conditions have reported difficulty managing these complicated regimens.<sup>12</sup> Currently there are no studies articulating mechanisms that Aboriginal and Torres Strait Islander peoples are using to manage this level of complexity in their medication regimens. There is potential for community-based services that are trusted and valued by the community, to contribute to supporting complex medication regimens.

Dose Administration Aids (DAAs) are hand or machine packaged medications dispensed by the pharmacist and designed to support timely and consistent medication taking behaviours and therefore improve adherence to medication regimens.<sup>13</sup> DAAs are provided to eligible Aboriginal and Torres Strait Islander peoples in Australia at no cost through the Quality Use of Medicines Maximised (QUMAX) program and as a supplementary service within the Integrated Team Care (ITC) program of Primary Health Networks.<sup>14,15</sup> These programs aim to improve chronic disease management, case coordination, medication management and QUMAX also aims to strengthen relationships between pharmacists and Aboriginal patients.<sup>14-16</sup>

In 2013, DAAs were added to the list of supplementary services to be provided to the ITC program. Given that adherence support needs to be ongoing to be effective, it was important to understand the efficacy of DAAs to build evidence to ensure funding would continue. This is important particularly when programs that provide funding to QUMAX are renegotiated every five years, and the funding that enables the ITC program can change at any time.

To understand what it already known about the experience of the use of DAAs by Aboriginal and Torres Strait Islander peoples, a review of the literature was undertaken. As early exploratory searches had revealed a dearth of literature on DAA use amongst Aboriginal and Torres Strait Islander peoples, in Australia or elsewhere, a scoping review provided an appropriate framework.<sup>17</sup>

The study was led by an Aboriginal woman (EW), with many years' experience in primary health care and community-controlled Aboriginal health services, and was guided by a community reference group of local Aboriginal Elders from the North Coast of NSW. The study was sparked by changes to inclusions of supplementary services for the ITC program, specifically the addition of DAAs, and from stories about pharmacy and medication management over many years from community.

The goal of this paper is to report the results of a scoping study to identify what is known about the use of DAAs by Aboriginal and Torres Strait Islander peoples as a mechanism to help tackle the

complexity of multiple medication and to inform the benefits of undertaking further research into the topic.

## 2 | METHODS

### 2.1 | Scoping review

A scoping review brings together the literature for under-researched topics with a view to mapping what is found by volume, nature and characteristics.<sup>17</sup> This type of review is a form of research synthesis that, through the mapping process identifies sources of literature, and concepts and gaps in the literature for a specific subject.<sup>17-19</sup> Pham et al proposed a five-stage process: (a) identifying the research question, (b) identifying relevant papers, (c) selecting the studies, (d) charting the data and (e) collating, summarising and reporting the results.<sup>17,18</sup> They contend that the role of a scoping study is to understand the breadth and nature of research available and its value within its field in order to be able to plan for future research, inform or influence policy makers.

### 2.2 | Data sources and search strategy expert

Through a series of preliminary searches, three key concepts: (a) Indigenous, (b) outcomes, that is, adherence, compliance and (c) DAAs were identified to best represent the subject of inquiry.

The search protocol for this scoping review was developed with the expert assistance of an information specialist. They worked with the authors to develop the search terms based on the key concepts and advised on the best method for developing the search strategy that was then used to identify the relevant literature.

### 2.3 | An example of the ProQuest search

ab("Dose administration\*" OR "Drug package\*" OR "Packed medication\*" OR "Blister pack\*") AND ab("Medication adherence\*" OR "Patient compliance\*" OR "Medical compliance\*") AND ab(Aboriginal\* OR Indigenous\* OR "First Nations" OR "Torres Strait\*") AND Australia.

As government programs such as QUMAX and ITC are relatively recent (beginning after 2010)<sup>14-16,20</sup> it was important to search within a time period that permitted literature, which reported findings from before these programs commenced to be identified. Therefore, beginning searching was limited to English language literature published between 1998 and 2021. Searches were completed using the PubMed and Medline via Ovid, CINAHL, ProQuest and Web of Science databases. Further literature was garnered from the bibliographies of papers identified from the search and grey literature through Google search which included the Australian Indigenous HealthInfoNet.

Once the expanded literature identified was collected into Endnote, duplicates were removed, and titles and abstracts were reviewed for relevance. Papers were then mapped by nature and characteristics, [Table 1](#), and a summary provided.

## 2.4 | Inclusion criteria

Papers were included if they were Australian and incorporated: the search terms; discussions regarding medication adherence (other than a cursory reference) and Aboriginal and Torres Strait Islander peoples; chronic disease management and Aboriginal and Torres Strait Islander peoples; programs delivered to Aboriginal and Torres Strait Islander peoples related to their chronic disease; papers specific to Aboriginal and Torres Strait Islander peoples/populations and medications and/or barriers to medication-taking; discussions regarding DAAs as a solution for medication adherence for Aboriginal and Torres Strait Islander peoples, and any literature that supported the need for further study regarding DAAs and Aboriginal and Torres Strait Islander peoples.

## 2.5 | Exclusion criteria

Papers were excluded if they did not focus on one of the three key search terms: indigeneity, DAAs, or health outcomes. Papers were also excluded if DAAs were discussed only in relation to nursing home care and not for people living in the community; randomised control trials of drugs or other interventions, papers that related to other countries; and where use of DAAs was not their focus.

Full-text reviews were completed to determine papers to be included in the review. The papers included supported the understanding of what was being studied in relation to DAAs and Aboriginal and Torres Strait Islander people, the programs that provided them, and to understand the context of use or provision. From the revised search in 2021, all papers were re-read (except for one new paper which was read for the first time), and comparisons across papers made. The content of these papers was charted in a Microsoft Excel spreadsheet, and comments relating to the type, characteristics, relevant findings and value of each were noted. These papers enabled the authors to identify weaknesses and key gaps in the current literature and to draw conclusions that would support further studies.

See [Table 1](#), Characteristics of included papers.

## 3 | RESULTS

There were 462 papers identified through the PubMed and Medline searches, and six documents identified through grey literature searches. After duplicates were removed 430 papers remained, titles and abstracts were then screened and confirmed for eligibility, at this stage, 400 papers were excluded.

As this process continued, it became clear that much research had been completed into medication adherence and specific diseases; however, the majority did not relate to or were from the Aboriginal patient experience or perspective and thus were excluded.

The full text of the remaining 30 papers were obtained for review. A further 17 documents were excluded after examination for relevance leaving 13 papers that met the specific inclusion criteria ([Figure 1](#), Prisma diagram), The type and numbers of papers included in this study are provided in [Table 1](#).

Of the 13 papers included in this review, all were targeted to Aboriginal and Torres Strait Islander peoples, no Torres Strait Islander focused papers were uncovered as a part of the search. Of these, seven papers covered included Aboriginal and Torres Strait Islander peoples or international First Nations peoples, adherence and DAAs, and the remaining six papers covered either adherence or DAAs.

### 3.1 | Papers covering all three search terms

There were seven papers that covered all three search terms, these included the following: (1) a guide to support pharmacists care of Aboriginal and Torres Strait Islander peoples<sup>22</sup>; (2) an original article which aimed to identify available strategies to promote medication adherence among Aboriginal people with cardiovascular disease<sup>23</sup> based on the literature, (3 and 4) two opinion pieces or editorials<sup>24,25</sup>; (5) a systematic review regarding adherence<sup>8</sup>; 6) one evaluation of the QUMAX<sup>14</sup> program and 7) a submission to parliament.<sup>21</sup>

### 3.2 | Paper 1 – Guide to providing pharmacy services

The Guide to providing pharmacy services to Aboriginal and Torres Strait Islander people was developed by a project working group of pharmacists, Aboriginal advisors using a lead writer and consultant. It was written on behalf of the Pharmaceutical Society of Australia in 2014 and aimed to guide pharmacists in providing better care to Aboriginal patients. The Guide includes the following: communication techniques; information about culture; suggestions for providing culturally safe care, the; the constituents of a culturally safe pharmacy; information regarding programs designed for Aboriginal and Torres Strait Islander peoples to support access to medications; and a description of an Aboriginal traineeship program supporting Aboriginal secondary school students into a school-based traineeship as pharmacy assistants.<sup>22</sup>

The Guide provided a comprehensive description of government run programs to reduce barriers and improve access to medication and advice including QUMAX, the ITC, Section 100 (S100) Pharmacy Support Allowance, Remote Area health programs, the National Government Closing the Gap program, the Pharmaceutical Benefits Scheme (PBS) Co-Payment measures, and medications listed on the PBS specifically for Aboriginal and

TABLE 1 Characteristics of Included

Ref	Author, year, Country	Title	Aboriginal and Torres Strait Islander	Outcomes eg (adherence)	DAA's
6	de Dassel JL, Ralph, Anna P, Cass, Alan. (2017) (Australia)	A systematic review of adherence in Indigenous Australians: an opportunity to improve chronic condition management	✓	✓	✓
10	Swain, L Barclay (2013) (Australia)	They've given me that many tablets, I'm bushed. I don't know where I'm going: Aboriginal and Torres Strait Islander peoples' experiences with medicines	✓	X	✓
12	Urbis (2011) (Australia)	Evaluation of the Quality Use of Medicines Maximised for	✓	✓	✓
14	Couzos, S, Sheedy V, D Delaney Thiele (2011) (Australia)	Improving Aboriginal and Torres Strait Islander people's access to medicines--the QUMAX program	✓	✓	X
19	Drew, Steven (2008) (Australia)	Submission 46 = Enquiry into The Life Expectancy Gap Between Indigenous and Non-Indigenous Australians	✓	✓	✓
20	Swain, L (2014) (Australia)	Guide to providing pharmacy services to Aboriginal and Torres Strait Islander people	✓	✓	✓
21	Davidson PM, Abbott P, Davison J, Digiacomio M. (2010) (Australia)	Improving medication uptake in Aboriginal and Torres Strait islander peoples. Heart Lung Circ. 2010;19(5-6):372-7	✓	✓	✓
22	Larkin, C, Murray, R (2005) (Australia)	Assisting Aboriginal patients with medication management	✓	✓	✓
23	Stoneman, J Taylor, S (2007) (Australia)	Improving access to medicines in urban, regional and rural Aboriginal communities--is expansion of Section 100 the answer?	✓	✓	✓
24	Swain (2014) (Australia)	Attitudes of pharmacists to provision of Home Medicines Review for Indigenous Australians	✓	X	✓
25	Trivedi et al (2016) (Australia)	Hospitalizations for Chronic Conditions Among Indigenous Australians After Medication Copayment Reductions: the Closing the Gap Copayment Incentive	✓	✓	X
26	Stoneman, J Taylor, S (2007) (Australia) (pharmacists views)	Pharmacists' views on Indigenous health: is there more that can be done? Rural Remote Health	✓	X	X
27	Benson, J, (2005), (Australia)	Concordance--An alternative term to 'compliance' in the Aboriginal population	✓	✓	X

Document Type (eg Report, study, review, opinion etc)	Subject	Results
Systematic review	The dichotomy of pharmacy opinions of adherence levels for Aboriginal and Torres Strait Islander people	Literature review of the papers related to Aboriginal peoples and levels of adherence from patient and pharmacist perspectives. The study found little evidence of appropriate measurements of adherence generally
Study	Medication management, Aboriginal people	18 focus groups, 101 Aboriginal peoples; patient response to home medication reviews and managing multiple medications daily
Evaluation report	QUMAX – improving access to medications	Telephone interviews with 23 Aboriginal Community Controlled Health Services (ACCHSs); and 24 participating community pharmacies; 12 case study field visits to participating ACCHSs and community pharmacies providing opportunities for in-depth face-to-face discussions with Program stakeholders, including patients; In-depth interviews with NACCHO Affiliates and Quality Use of Medicines Support Pharmacists (QUMSPs); an online survey of participating ACCHSs; an online survey of participating community pharmacies; analysis of PBS utilisation data; analysis of 4CPA IT data; and participation in, and presentations at, national QUMAX workshops and related conferences
Opinion piece	QUMAX – – improving access to medications	Commentary of QUMAX program; PBS co-payment – access good quotes and numbers in this Program explanation
Submission to parliament	The capacity of pharmacy to improve Aboriginal health and wellbeing	Pharmacy-based interventions and challenges to improve health and well-being. Commentary/opinion in relation to CTG targets
Guide provision of care	Medications, pharmacy, culturally appropriate care	Consultant writer, project working group, Aboriginal and Torres Strait Islander peoples and pharmacists developed this guide with funding from the Pharmacy Society of Australia; explanation of pharmacy related programs; calls for more study
Opinion piece	Medication, adherence	Links between adherence and ill-health; strategies to improve adherence such as QUMAX, that remove barriers are important to support the CTG targets
Opinion piece	Medication adherence; Aboriginal peoples	Approaches and challenges to medication adherence amongst Aboriginal peoples
Opinion piece	Medication access in various settings for Aboriginal people in Australia	Related specifically to the Rural S100 program, concepts of health, supports further research into adherence, talks about health status, literacy
Study	Aboriginal peoples' experiences of medication	18 focus groups, 101 Aboriginal peoples, Patients responses the home medication reviews
Systematic review	Hospitalizations for diabetes, asthma, chronic obstructive pulmonary disease, hypertension, heart failure and cardiovascular events	Up to 42,651 Aboriginal people over 15/16 in urban and remote settings Australia; Removal of financial barriers through co-payment and the number of hospitalisations for chronic conditions – back up medication taking improves health/ CTG Scripts
Study	Pharmacist views on Aboriginal health	27 pharmacists working with Aboriginal populations; Pharmacists attitudes and behaviours – Need for cultural awareness, no time to complete etc Barriers seen mostly as related to money
Opinion piece	Concordance as best practice for adherence as opposed to compliance	Concordance – discussion regarding quality of care relating to adherence Pharmacist relationships with Aboriginal patients, social determinants of health

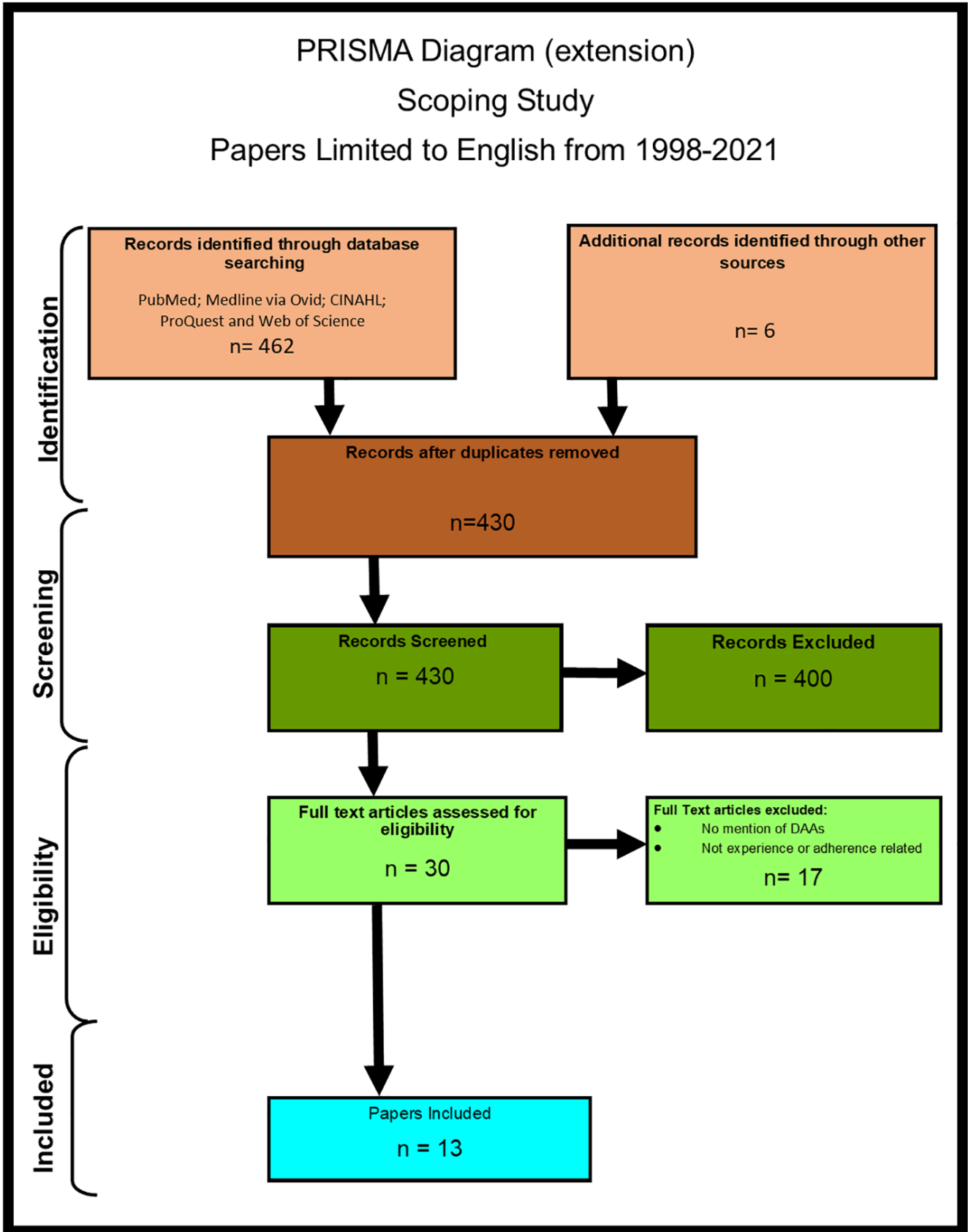


FIGURE 1 PRISMA diagram

Torres Strait Islander peoples.<sup>22</sup> The Guide is, therefore, vulnerable to the need for regular updating although at the time of writing this paper was still current.

### 3.3 | Paper 2 – Original article

This paper written by Davidson et al, nursing, academics and doctors from an Aboriginal Community Controlled Health Service in NSW, identifies the need to best understand barriers and enablers for medication adherence for Aboriginal people with cardiovascular disease through existing literature.<sup>23</sup> Various programs available to Aboriginal people attending an ACCHS define are explained. The paper discusses the importance of looking at adherence from various levels, including the system, the patient, the clinician and the pharmacist, and identifies, based on the literature, what can be done at each level. Davidson et al the notes importance of culturally safe care, engagement of communities and the simplification of medication regimen and opportunities to support medication taking using techniques such as DAAs. The paper supports subsidised medication an important contributor for better health outcomes for Aboriginal people.

### 3.4 | Paper 3 and 4 opinion pieces

The first of the two opinion pieces is a paper written by Larkin, a Pharmacist Academic based in the Kimberly, focussed and offers practical suggestions for health professionals to assist Aboriginal patients with managing their medication.<sup>24</sup> It recommends being aware of a patient's lifestyle including where and how they sleep, storage considerations, for example, is refrigeration present and reliable and if the patient understands how and when to take their medications. This paper argues that DAAs, among other tools, can be an appropriate strategy, when also taking into account the logistics of lifestyle, climate and medication type, and that simplifying the medication regimen could assist in improving medication uptake and adherence for Aboriginal patients.<sup>24</sup> The paper cites an example of a health service in the Tiwi Islands, which had decided to employ a pharmacist, and packed medications into DAAs in the clinic. It noted the introduction of the pharmacist service resulted in an increase in the collection rates of DAAs. However, this paper did not provide any insight into adherence rates or the experiences of the patients using them.<sup>24</sup>

Stoneman and Taylor et al<sup>25</sup>, pharmacy academics who conducted research with Aboriginal communities in central western NSW, provided an editorial paper in the Rural and Remote health journal that discussed the origins of programs such as QUMAX and S100, and the importance of ensuring access to medicines. The paper also notes how important culturally safe care is, and how a strong relationship between a patient and the pharmacist improved quality use of medicines. To this end, the paper also notes that various strategies, that had been identified in pharmacy program evaluations to assist Aboriginal and Torres Strait Islander peoples to manage medicines, had not at that point been implemented.

### 3.5 | Paper 5 – Systematic review

This review, by experienced Aboriginal health researchers aimed to identify adherence to complex medication regimens in Aboriginal populations of Australia and to understand the nature of barriers or supports to adherence. Many of the papers found in the review were related to specific chronic diseases and adherence. The review finds that there is little published evidence as to the difference between adherence rates in Indigenous and non-Indigenous populations in Australia.<sup>8</sup>

### 3.6 | Papers 6 and 7 – Government reports and submission

The QUMAX evaluation<sup>14</sup> conducted by Urbis, a consulting firm for the Commonwealth Department of Health, in, included evaluation of the provision of DAAs in this program. Data collection included surveys of staff within National Aboriginal Community Controlled Health Organisations, (NACCHO) and Aboriginal Community Controlled Health Organisations (ACCHSs). Twelve in-depth interviews were completed with patients who benefited from QUMAX, and data from the PBS and data relating to the implementation of the 4th Pharmacy Agreement IT system were also analysed.

The evaluation reported outcomes on the QUMAX program. These included increased contact between patients using DAAs and their ACCHSs, increased positive health outcomes and an improvement in patients managing their own health.

Patients reported that the QUMAX program improved their access to medications due to the reduction of financial barriers in purchasing medicines and improved their ability to access medications through transport supports. Participants reported that DAAs helped with medication taking and that their health had improved due to consistent medication use.

Clinical services that provided the QUMAX program reported an improvement in attendance of patients to appointments and linked this to the reduction of financial barriers to medications, and 82% of services providing data for the evaluation noted the frequency of visits increased. Increased attendance was confirmed through an increase in MBS billings, (most services stated this anecdotally during qualitative data collection). The evaluation reported that QUMAX supported an improvement in the quality of care, facilitated better discussions regarding medications, the ability for services to conduct assessments and health checks and to respond to the results of these. Seventy-one percent of services believed there was an increase in confidence of patients in managing their health after the program.

The evaluation also found approximately 14% more patients using PBS Co-payment scripts. In terms of measuring adherence to the medication regimens prescribed, the ACCHs reported this was difficult to measure. The evaluation found many strengths in the program and was most successful where there was support for QUMAX at all levels, program and locally. The program design itself

was seen as being transferrable to other health programs where partnerships existed.

In 2008, the Pharmaceutical Society of Australia, NSW Branch, provided a submission to parliament as a part of the Inquiry to overcoming Indigenous Disadvantage.<sup>21</sup> The paper covers a wide range of areas relating to the capacity of the pharmacist role to improve the health and wellbeing of Aboriginal and Torres Strait Islander peoples. These included improvements in medication reviews, reducing barriers such as access to medications, addressing and ameliorating cultural differences, and communication differences. The submission provides five recommendations to improving education to pharmacists, fact sheets for pharmacies for Aboriginal patients, and the use of DAAs to improve adherence.

### 3.7 | Summary of papers covering all three key concepts

None of the papers addressing all three key concepts had undertaken research specific to adherence because of the use of DAAs, and it was very clear that none of the papers provided the voice or addressed experiences of the patient.

### 3.8 | Summary of other papers included in this study

Of the six papers that covered two of three concepts, only two of these papers reported the perspectives of the patient.<sup>12,26</sup> Four of the six papers were based on the five programs available to Aboriginal and Torres Strait Islander peoples through government funding: Home Medication Reviews (HMRs), PBS Closing the Gap (CTG) Scripts, the Remote Area Aboriginal Health's S100 program and the QUMAX program.<sup>12,16,26,27</sup> These four papers explained the intricacies of each program and the positive effects that they have had for Aboriginal people and their health from the perspective of the authors. These programs are all designed to reduce barriers for access to medications and to improve relationships between patient and provider, to improve medication adherence and reduce hospitalisations for chronic illness.<sup>12,16,27</sup> Papers also talked about pharmacist perspectives of adherence, medication dispensing and barriers.<sup>16,28</sup> Benson, a medical officer at a South Australian ACCHS provided an opinion piece on the importance of the use of language and used the term concordance as an alternative to the word compliance. This suggested shift and a move from the "doctors' orders" style of caregiving to agreements made between patients and their general practitioner.<sup>29</sup>

### 3.9 | Observations

Overall, the papers reviewed for this scoping review provided opinion from professionals or policy makers, with limited empirical

evidence, that medication adherence was supported or improved with the use of DAAs; however, there was no data identified that suggested they were not a useful tool. Because of the dearth of the studies found most of which were literature reviews, and the lack of DAA focused studies, it was hard to draw a conclusion that DAAs can improve adherence, either singly or as a part of a suite of interventions.

Within the studies, approaches to medication adherence varied. This included a range of aids possibly as a single intervention through to the use of them within a regimen of an education program, regular appointments with the pharmacist and the use of other reminder tools such as phone applications.

A wide range of barriers to medication adherence by Aboriginal and Torres Strait Islander peoples, were identified in the papers. These included financial barriers, cultural differences which may lead to judgements and misunderstandings about the medications themselves, relationships between health professionals and patients, the quality of which can cause disempowerment and or confusion, and complexity of medication regimens.<sup>12,16,25-29</sup>

Data quality and amount of data available were a key theme across the papers. Most of the systematic reviews reported either low quality of data available and or low numbers of studies focusing on this topic.

### 3.10 | Recommendations

Various recommendations were made throughout the papers studied in this scoping review. These included: using DAAs as a part of a broader regimen that would help to improve adherence; improved patient/clinician relationships that could create better opportunities for education by a pharmacist or other health professional within the pharmacy or health service, more regular health promotion interactions with relevant teaching on medications and their use. The building of trust across practitioner and patient was generally espoused as a means to improve the patients' ability to understand and manage medications.<sup>12,22,24</sup>

### 3.11 | Limitations of available papers

Poor data quality commonly discussed in the papers and limited availability particularly of studies reporting responses from Aboriginal patients identified the need for further empirical study of this topic.

One notable limitation is that most of the papers focusing on Aboriginal people did not include data that came from mainstream (non-ACCHS) services. The evaluation of the QUMAX program identified that data were only collected from ACCHS<sup>14</sup> or community pharmacists<sup>25</sup> leaving out a percentage of Aboriginal people who use mainstream services. Only one empirical study used data from various sources including Practice Incentive Payment information (PIP) from Medicare Australia or Pharmaceutical Benefits (PBS) Scheme Co-payment information from the Australian Government

Department of Health, and hospitalisations from various regional and remote locations. This made it difficult to ascertain what type of primary health care service participants used.<sup>27</sup>

### 3.12 | Call for further study

Papers noted the need for further empirical study regarding medication adherence<sup>8,23,27</sup> and Aboriginal and Torres Strait Islander peoples. Recommendations for future research included examination of the appropriateness of prescribing aids across various age groups, whether adherence may vary depending on type of disease or health condition, and further study regarding regimens prescribed to patients including the number and type of medications taken and their frequency. Aboriginal and Torres Strait Islander peoples and their adherence to medication as well as the use of DAAs generally, was strongly promoted as needing better informed evidence.

## 4 | DISCUSSION

This scoping review identified literature regarding the use of DAAs with Aboriginal and Torres Strait Islander peoples. Thirteen papers were included in this study. Six papers covered all three search parameters (Indigeneity, outcomes such as adherence and DAAs), none of which were empirical studies. These six papers provided (a) some explanations of subsidised and funded pharmacy related programs available to Aboriginal and Torres Strait Islander peoples, (b) suggestions for best ways of working with Aboriginal and Torres Strait Islander peoples to improve medication adherence, (c) insights from a clinician working with Aboriginal and Torres Strait Islander peoples, (d) the results of a program designed specifically to remove the barriers that exist to access medications that could improve adherence and (e) some review of the existing literature as it refers to adherence and Aboriginal people.

Papers generally recommended the use of DAAs, both as an individual response to better medication management and as a part of a series of health promotion and patient education activities. How DAAs were to be used, however, was dependent on the individual's health care needs and types of medications prescribed. The evidence that informed most papers was opinion from experts in their fields, rather than empirical studies about the efficacy of DAAs as a method of improving medication adherence among Aboriginal and Torres Strait Islander peoples. It is, therefore, difficult to draw conclusions about DAAs improving adherence amongst Aboriginal and Torres Strait Islander peoples.

### 4.1 | Gaps in data and calls for further research

The literature search did not identify studies solely focused upon the use of DAAs with Aboriginal and Torres Strait Islander peoples in Australia or first nations peoples elsewhere. Most of the systematic

reviews, opinion pieces and evaluations examined called for research into medication adherence and use of DAAs with Aboriginal populations. It was very clear from literature that there was a need to develop a consistent approach in both methodology and the population or disease studied, to draw clear conclusions about the how effective DAAs are in improving medication adherence. Papers also highlighted the need for further research to really understand what the barriers and enablers of medication management are in this population group.

Data collected for the studies that related to Aboriginal and Torres Strait Islander peoples were generally sourced from ACCHS, meaning that other than the one study that focused on hospitalisations for chronic care patients, those who did not attend ACCHS were not included in the studies. It is unclear the proportion of Aboriginal and Torres Strait Islander peoples who use an ACCHS compared to mainstream general practices, and therefore the effects on the data are unclear and problematic in drawing significant conclusions.

There was no clear evidence-based recommendation of the best methods to improve medication adherence, even though it was mentioned in several papers that multi-faceted approaches may provide better outcomes than a single strategy.<sup>12,24</sup> DAAs were generally identified as part of a possible solution rather than a single strategic approach to managing disease and medication regimens.

Importantly what was missing from most of the papers was the voice of the Aboriginal patient. Swain et al focused on the patient voice regarding home medication reviews.<sup>12</sup> As noted, the ability to measure adherence is difficult unless the effectiveness of DAAs or other tools are seen by the health professional through the experience of the patients to whom they are dispensed. Self-reported adherence and the patient perspective could assist to better understand the cultural barriers and enablers of improved medication management; to better understand the types of approaches that may support improved adherence; and to identify adherence rates for Aboriginal and Torres Strait Islander peoples including the uptake of the PBS co-payment scheme through all types of general practice or other services.<sup>29</sup>

### 4.2 | Strengths and limitations of this scoping review

Five databases were searched, Medline via Ovid, PubMed, CINAHL, ProQuest and Web of Science, all well known to be able to search a wide range of papers, with a goal to identify research on Aboriginal and Torres Strait Islander peoples' use of DAAs. Wider searches were completed for grey literature to ensure the largest possible informative base material was found.

The scoping study was completed over a long period of time, which could be seen as both a strength and limitation. What is clear though, is there is still little published information that describes an Aboriginal and or Torres Strait Islander patient's perspective of the use of DAAs, and if they do support their medication taking behaviours.

## 5 | CONCLUSION

This scoping review process builds a picture of outcomes, barriers, limitations and gaps in understanding of medication management with Aboriginal and Torres Strait Islander peoples and of their use of DAAs, across settings and as part of a range of other interventions.

Data regarding DAAs and adherence from a patient's perspective is lacking, specifically the voice of Aboriginal and Torres Strait Islander peoples at the centre of this process have not been heard or investigated.

Further studies are required to understand the experiences and perceptions of the use of DAAs and medication adherence within this population. Research may provide insights that support policy development and continued funding of current programs or highlight areas that need further attention and possibly funding supports. Empirical data could identify actions necessary to address important health priorities for Aboriginal and Torres Strait Islander peoples.

### ETHICS APPROVAL AND CONSENT TO PARTICIPATE

Ethics permission was obtained from the New South Wales Aboriginal Health and Medical Research Council's (AHMRC) Ethics Board in 2014 (HREC Approval number 1050/14).

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### CONFLICT OF INTEREST

The authors declare that they have no competing interests.

### AUTHORS' CONTRIBUTIONS

EW and LB designed and executed the study, EW constructed and conducted the literature searches, EW drafted the paper. All authors, EW, LB and JL, provided intellectual input in various stages as well as reviewed and approved the final manuscript.

### DATA AVAILABILITY STATEMENT

Data generated and analysed during this study are included in this published article (and its supplementary information files).

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