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Child Development Allied Health Services in Rural and Remote Areas: A Systematic Scoping Review of Drivers, Barriers and Enabling Strategies to Delivery of Services

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ABSTRACT

Background: Access to child development allied health services is challenging in rural and remote areas. A companion review has described the types of models of care that are used to deliver these services and their impact on the quality of healthcare.

Objective: This review aimed to identify service drivers for, and barriers and enabling strategies to the delivery of these services.

Design: A scoping review was conducted in alignment with the Joanna Briggs Institute methodology and PRISMA methodology. Data from included citations were thematically organised to describe and connect drivers, enabling strategies and barriers.

Findings: Twenty-five citations met the inclusion criteria. Six key drivers were identified, four key enabling strategies and five key barriers.

Discussion: Most models of care were driven by the need to address the inadequacy of child development allied health services. Place-based strategies were described by most citations as key to enabling the delivery of new models of care. However, understanding the community's capacity for a new model of care was a prominent barrier to implementation.

Conclusion: Findings from this review highlight the complexities of devising and delivering new models of care for children in rural and remote areas with developmental needs. While place-based approaches were the most widely adopted enabling strategy, these strategies presented their own challenges. Understanding community needs, capacity and assets from end-user (including children) perspectives is complex but should underpin designing and implementing models of care.

1 | Introduction

Rural and remote people experience a myriad of challenges in accessing appropriate healthcare [1]. These challenges include geographical isolation, availability of the health workforce and reduced resources such as physical equipment and finances [2, 3]. Within this context, concerns are amplified for vulnerable

populations, such as children, that may require specialised services [4]. Developmental disabilities in children are prevalent at higher rates in rural areas, with the impact of this presenting potential lifelong challenges [5, 6].

Access to adequate and appropriate allied health services can assist children's healthy development [7]. Allied health

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Summary

- What is already known on this subject
 - Children in rural and remote areas are more developmentally vulnerable than their metropolitan counterparts.
 - There are various models of care used in rural and remote areas to deliver child health services.
 - All styles of models of care are able to demonstrate changes in the quality of healthcare and child health-related outcomes.
- What this paper adds
 - This review identifies the drivers for enabling strategies and barriers to implementing new models of care for children with developmental needs.
 - This review provides a synthesised view of strategies that may assist in the implementation of rural child development services, specifically highlighting that place-based models may be most useful when delivering these services in rural areas.
 - Designing and implementing models of care should include end-user perspectives (children and the community) and be augmented by a comprehensive understanding of community needs, capacity and assets.

professionals (AHPs) are equipped to deliver the specialist services required for children's developmental health [7]. The evidence shows that the positive impacts these services have on developmental health are best obtained in early childhood, meaning that, due to lack of timely access to these services, some children in rural areas may not reach their full potential [8]. The lack of access to quality health care and early childhood education services for children in rural and remote areas has demonstrated increased vulnerabilities in this population compared to their metropolitan counterparts [9]. To reduce disparity in the quality of services, particularly effectiveness, timeliness and equity of services, rural and remote health services often use alternative models of care (MoC) to make the best use of available resources [10].

MoC is a concept that encapsulates the range of 'best practice' activities, contexts and mechanisms required to deliver quality patient care services to a specific population [11, 12]. The goal of a MoC is to 'ensure people get the right care, at the right time, by the right team and in the right place' [12]. A companion piece to this scoping review has identified four main styles of MoC used for children with developmental needs in rural and remote areas in developed countries [10]. MoC included: 'screening services' which screened children to identify needs; 'consultative services' which involved AHPs providing support to other AHPs or other members of the team around the child (TAC) (e.g., parents/carers, teachers); 'role substitution' where an AHP would take on the role of another AHP to deliver trans-disciplinary services; and 'online services' where services engaged the use of technology to provide therapy [10]. The four types of MoC were then mapped against five of the six domains of quality healthcare [13]; effectiveness, timeliness, equity, patient-centredness and efficiency, with no studies mapped against the domain of safety [10]. The companion review aimed

to understand the relationship between MoC type and its influence on child outcomes relating to quality domains. It identified that quality outcomes were observed regardless of the type of MoC deployed. Additionally, the companion review identified a gap in knowledge regarding the factors that may have contributed to the observed effectiveness of these MoC on quality outcomes. Understanding these factors could help rural communities and AHPs improve how they plan and implement new MoC. This current review aims to address this knowledge gap, answering the following questions:

1. What are the drivers for delivering different allied health MoC to children with developmental needs in rural and remote areas?
2. What are the enabling strategies and barriers to delivering various allied health MoC to this population group?

2 | Methods

This review was conducted and reported in alignment with the Joanna Briggs Institute (JBI) methodology for scoping reviews [14] and the Preferred Reporting Items for Systematic Review and Meta-Analysis extension for Scoping Reviews (PRISMA-ScR) protocol [15] (PRISMA Flowchart Figure 1; PRISMA Checklist Data S1). The complete methodology of this scoping review is described in detail in the companion paper [10]. The protocol for this scoping review was registered on Open Science Framework Registries (link removed for anonymity). In brief, the search strategy was co-developed with an academic librarian, included terms relating to 'children', 'allied health', 'development' and 'rural' (full search strategy available in Data S2), and a grey literature search was conducted, including thesis repositories, relevant peak bodies and research institutions. Backwards searching identified further papers, and content experts were sought where available. Articles were extracted against a PICO framework (Data S3). All articles were screened independently, in duplicate (author 1, 2 and 3 removed for anonymity) with discrepancies resolved via discussion. Data were extracted by one reviewer (author 1, removed for anonymity), with a second reviewer (author 3, removed for anonymity) extracting data from 25% of papers ($n = 7$) to ensure agreement.

2.1 | Data Synthesis

Data were based on the outcomes from the search strategy detailed in a companion paper [10]. Data were extracted onto an author-developed extraction protocol housed in an Excel spreadsheet. Realistic Evaluation methods [16], informed by logic models, underpinned the data synthesis process. Logic models, a type of conceptual model, have been shown to be beneficial when examining the complex relationships between factors and outcomes and have been reported as a useful tool to inform healthcare decision-making and change [17]. Theory detailed in 'Realistic Evaluation' [16], exploring the interplay of contexts, mechanisms and outcomes, underpinned by logic models, along with previous research acted as a guide for synthesis [18]. Modelling from this understanding, the synthesis

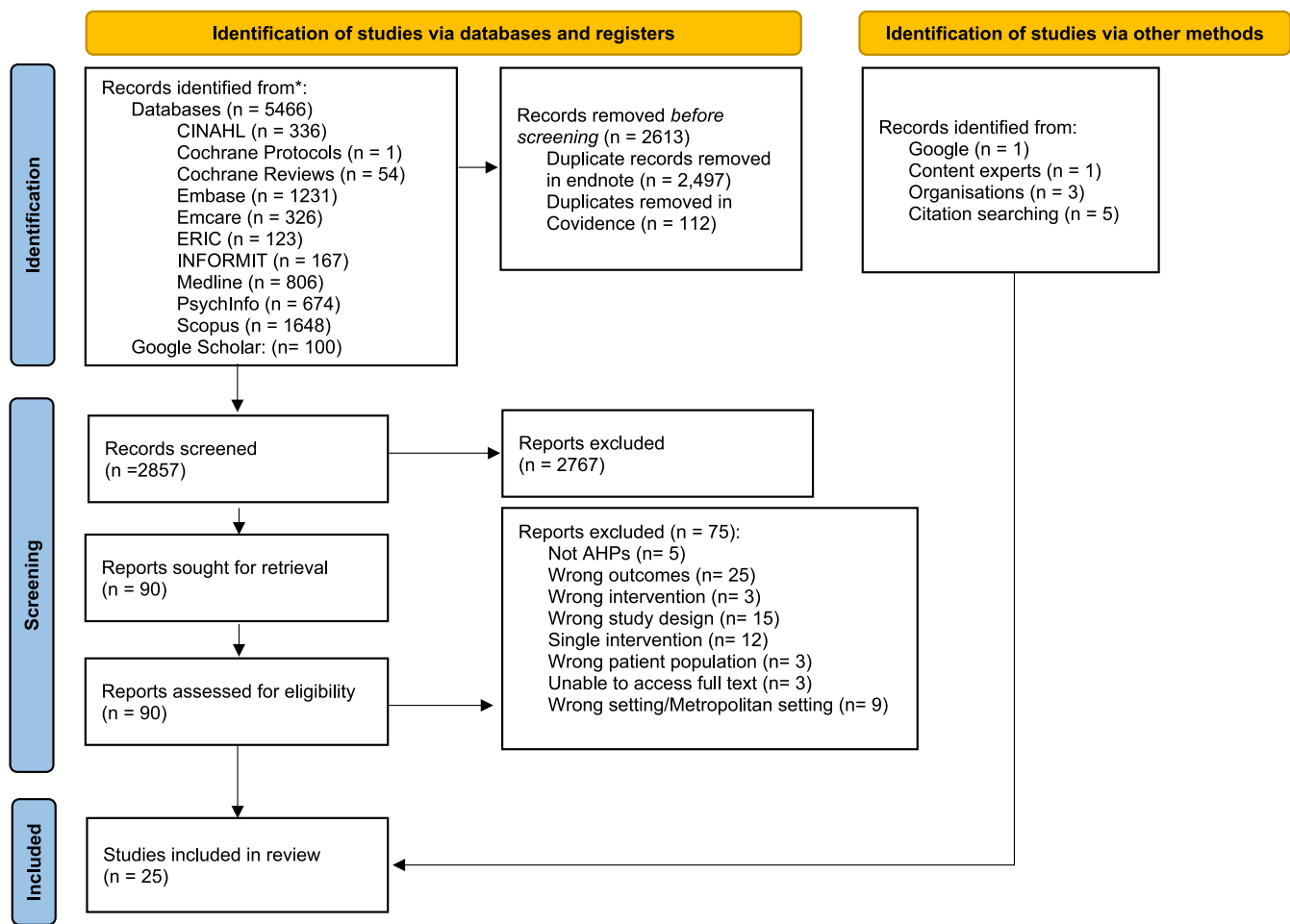


FIGURE 1 | PRISMA flow chart. *Consider, if feasible to do so, reporting the number of records identified from each database or register searched (rather than the total number across all databases/registers). **If automation tools were used, indicate how many records were excluded by a human and how many were excluded by automation tools. From: Page MJ, McKenzie JE, Bossuyt PM, et al. The PRISMA 2020 Statement: An Updated Guideline for Reporting Systematic Reviews. BMJ 2021;372:n71.

process was conducted as follows. All extracted data were collated and grouped as ‘drivers’, ‘enabling strategies’ or ‘barriers’. Drivers were identified as the reported motivation for the new MoC. Specifically, drivers addressed the question ‘why did this MoC/intervention take place?’ For each citation, these were found within the aims and introduction. Enabling strategies were identified as all strategies reported within the citation that aimed to, or were found to, improve the service. Enabling strategies were primarily extracted from the methods and results of the citations. Barriers were identified as reasons that made accessing the new MoC more challenging [18]. These were extracted from the methods, results and discussion.

An iterative process allowed for data to be thematically organised by one author (author 1, removed for anonymity). This thematic organisation involved identifying similar themes within each of these categories, as is done when developing logic models [16, 17]. A second author confirmed the allocation of elements to themes, with 20% of the data being double extracted ($n = 7$), and all authors agreed on thematic coding via discussion. Julius AI (<https://julius.ai/>) was used to develop heatmap graphics of enabling strategies and barriers.

3 | Results

A total of 25 citations were included in the review. A full description of the systematic scoping search, MoC, and child health outcomes can be found in the companion paper [10].

3.1 | Drivers (Reasons for Implementing New Models of Care)

Fifty unique drivers were identified and thematically organised into six themes: ‘inadequate services’; ‘extensive travel’; ‘workforce challenges’; ‘long waiting lists’; ‘knowledge of needs and services’; and ‘low resources [infrastructure and financial]’ (Table 1).

The most common theme was ‘inadequate services’ ($n = 17$) [19–35]. This theme described new MoC implemented due to a lack of services that were able to address the specific needs of children with developmental concerns, delays and disabilities or where there were no services [19–35]. Examples of these included a lack of screening services [33] and difficulty in providing services for children diagnosed with autism [35].

TABLE 1 | Identified drivers to models of care for children with developmental needs in rural and remote areas.

Driver theme	Data
Inadequate existing services	<ul style="list-style-type: none"> • Access to disability services is problematic due to infrequent and inconsistent services [19]. <ul style="list-style-type: none"> • Limited access to services in this area [20]. • Limited services for children with disabilities in rural areas [21]. <ul style="list-style-type: none"> • Lack of allied health services [22]. • Fewer health professionals in rural areas so using student-led services [23]. • Inequity of access to [SLT] services in rural and remote communities [24]. • Lack of SLT and occupational therapy services in rural areas—insufficient access to allied health services [25]. <ul style="list-style-type: none"> • (appropriate) Application and dissemination of this therapy to those who are in need of it [26]. • Difficulties with accessing specialists/appropriate choice of therapist due to geographical location [27]. • Children in rural and remote areas are likely to experience limited or no access to paediatric allied health services [28]. <ul style="list-style-type: none"> • Access to services in rural and remote Australia is very limited—service to improve inequality [29]. • Service delivery barriers—providing adequately intensive treatment and barriers to accessing services for children with long-term conditions [30]. • Need for improved (and informal) access to speech pathology services for preschool-aged children in the Bendigo region of Victoria [31]. <ul style="list-style-type: none"> • Struggling to develop a comprehensive service delivery system [in this area] [32]. <ul style="list-style-type: none"> • Screening service due to lack of child services in these areas [33]. • Difficulty providing services to increase service delivered in schools [34]. • Difficulty providing early intervention services to children diagnosed with autism spectrum disorder [35].
Extensive travel	<ul style="list-style-type: none"> • Difficulty accessing remote areas—lack of services requiring exhaustive travel. Need for services closer to home [36]. • Long-distance to travel with impacts (social impacts, accommodation, costs, disruption to work, sibling impacts, transportation costs and emotional consequences) [19]. • Children in this community would need to travel 2–3 h to access [SLT]. Currently long distances required to travel (people not receiving or accessing the screening and diagnosis they need) [20]. <ul style="list-style-type: none"> • Currently long distances required to travel (2–3 h to access health services) [23]. • Challenges associated with travel [for child, parents and speech and language therapists] can result in inequity of access to SLT services [24]. <ul style="list-style-type: none"> • Long distances required to travel for services [37]. • Increased travel due to geographical location [27]. • Difficulty accessing services due to long distances required to travel [38].
Workforce challenges	<ul style="list-style-type: none"> • Disability workforce shortages [19]. • Difficulty with recruitment and retainment [21]. • Therapists regard disability as a specialist area, requiring peer support, training and supervision [21]. • Difficulty with recruitment and retention of staff—speech and language therapists are a scarce resource [37]. • Low (early childhood intervention) resources (people to deliver services) in rural areas and evaluating a service implemented [39]. • Time constraints and understaffing leading to difficulty accessing health professionals in rural areas [40]. <ul style="list-style-type: none"> • Maldistribution of Australia's health workforce/recruitment and retention challenges [28]. <ul style="list-style-type: none"> • Rural communities are disadvantaged by scarcity of health professionals [41]. • Long waitlists for specialist services due to lack of providers and resources [42].
Long waiting lists	<ul style="list-style-type: none"> • (Generalised) 'Long waiting lists' [19, 37, 40]. • Due to high demand for therapy there is a very long waiting list with children often missing out [23]. <ul style="list-style-type: none"> • Long waitlists due to geographical location [27]. • Long waitlists for services for children with behavioural problems [42].
Lack of knowledge of needs and services	<ul style="list-style-type: none"> • High levels of disease among this population [Aboriginal and Torres Strait Islander children]. Aiming to reducing the rates and impact of [ear disease and hearing loss]—community invited due to concern with ear health [36]. <ul style="list-style-type: none"> • Lack of parental education in this area [20]. • Greater risk for children in this area to have developmental needs [28]. <ul style="list-style-type: none"> • Greater speech and language delays in this area [41]. • Lack of knowledge of services in rural areas [38].

(Continues)

TABLE 1 | (Continued)

Driver theme	Data
Low resources (physical and financial)	<ul style="list-style-type: none"> • Improving use of resources to make better diagnoses and improve referral due to limited funds [43]. • Low early childhood intervention resources (physical) in rural areas and evaluating a service implemented [39]. • Budget restrictions [40]. • Addressing the need for having cost-effective and beneficial home-based services [32]. • Long waitlists for specialist services due to lack of providers and resources [42].

Abbreviation: SLT, speech and language therapy.

New MoC were also introduced to address challenges around ‘Extensive travel’ ($n=8$) [19, 20, 23, 24, 27, 36–38]. This theme described inequities related to distances to access services. ‘Extensive travel’ was a challenge for all stakeholders, as AHPs and families were both at times required to travel to either deliver or receive services. A citation utilising AHAs further described the impact of travel for families prior to receiving the service, which included the costs, disruption to work and other family members [19].

‘Workforce challenges’ ($n=8$) were identified as another reason for implementing a new MoC [19, 21, 28, 37, 39–42]. ‘Workforce challenges’ predominantly described workforce shortages and maldistribution of health workforces in rural areas [19, 21, 28, 40, 41]. This included citations that reported specific difficulties around a lack of childhood intervention therapists [21, 39, 42], a lack of speech and language therapists [37], a lack of disability service providers [19, 21] and a general scarcity of health professionals in rural areas [28, 41].

‘Long waiting lists’ were reported in six citations [19, 27, 37, 40, 42] as the driver for implementation of a new MoC. Three citations identified geographical isolation [27], a lack of specialist providers for children with behavioural ‘problems’ [42] and ‘we had no-one’ to provide service [19] as the driver of their waiting lists respectively, with a final three that did not specify reasons [19, 37, 40].

‘Lack of knowledge of needs and services’ ($n=5$) referred to unique factors, often specific to the local community [20, 28, 36, 38, 41]. In some citations, this was a lack of understanding of their ‘need’ for a service (e.g., lower health literacy) [20], while others were aiming to improve awareness of available services [38].

Finally, ‘funding, infrastructure and technology challenges’ ($n=4$), related to an identified need for cost-effective services and/or services that were suitably resourced [32, 39, 42, 43]. Two of these citations were aiming to improve the cost-effectiveness of their MoC due to current available services being expensive [32, 43] while three citations mentioned a lack of physical resources, such as assessment tools or electronic equipment to support their service [39, 42, 43].

3.2 | Enabling Strategies (Aiding Delivery of a New MoC)

Ninety-one enabling strategies were identified within the citations (Data S4). These were thematically organised into five

groups: ‘place-based approaches’ ($n=25$) [19–43]; ‘improved resourcing’ ($n=19$) [19–21, 23–25, 27–29, 31–36, 38–40, 42]; ‘alternate workforce strategies’ ($n=15$) [19–23, 27, 28, 30, 33, 36–39, 42, 43]; ‘capacity-building supports’ ($n=13$) [19, 23, 26–28, 30–33, 35, 37–40, 42] and ‘child-based elements’ ($n=2$) [26, 40] (Table 2).

The most commonly reported enabling strategy was ‘place-based approaches’ observed across all citations. These strategies involved using the child’s environment and utilising stakeholders in the area to deliver the MoC. Two subthemes were identified: ‘Use of local environments’ ($n=25$) [19–43] and ‘partnerships with stakeholders’ ($n=14$) [19–22, 24, 25, 28, 30, 32, 35, 36, 39, 41, 43]. ‘Use of local environments’ referred to services delivered in physical contexts within the community outside a traditional clinical setting. This included visiting clinics ($n=2$) [33, 36], schools ($n=13$) [20, 22–25, 27, 28, 31, 32, 34, 37, 38, 41] and the child’s home ($n=10$) [19, 21, 25, 27, 30, 32, 35, 39, 42, 43]. While there was variation in the delivery of these place-based approaches, the common thread was the focus on the community. For example, services involving Aboriginal and Torres Strait Islander Australians [36], identified enabling strategies such as including members of that community in the development of culturally safe practices, while another citation described the process of being responsive to the request of a local school to deliver in-school speech therapy [41] as an enabling strategy. ‘Partnerships with stakeholders’ involved culturally safe practices [22, 36], increasing the presence of health services [19], improving awareness of services [19, 21] and the involvement of parents and teachers in care delivery [20, 25, 28, 30, 32, 35, 39, 41].

‘Improved resourcing’ was another enabling strategy reported in $n=20$ citations [19–21, 23–29, 31–36, 38–40, 42]. ‘Improved resourcing’ related to a mix of personal, educational and infrastructure resources that enabled the delivery of a new MoC. Three resourcing subthemes were identified: ‘Optimisation of family-focused service delivery’ ($n=11$) [24–29, 32, 34, 35, 38, 39]; ‘improved [educational and infrastructure] resourcing’ ($n=8$) [19, 21, 23, 28, 31, 33, 36, 42]; ‘positive use of technology’ ($n=6$) [20, 24, 25, 32, 40, 42] and ‘optimisation of factors related to the child’ ($n=2$) [26, 40]. ‘Optimisation of child and family-focused service delivery’ included elements such as altering the length of sessions (longer [35] and shorter [34]) and increasing flexibility and adaptations of services [28, 34]. ‘Improved [educational and infrastructure] resourcing’ included the use of high-quality frameworks and funding models. Specifically, these included the use of guidelines [36], the inclusion in National Disability Insurance Scheme frameworks [19], government and other

TABLE 2 | Themed enabling strategies and barriers drivers to models of care for children with developmental needs in rural and remote areas.

Enabling strategies themed		
Theme	Subtheme	Data
Place-based approaches	Partnerships with stakeholders	<ul style="list-style-type: none"> • Culturally safe: partnership between the program and community [36] <ul style="list-style-type: none"> • Extensive cultural training in program [22] • Increased local awareness of service (through increased presence) [19] • Fixed monthly examination dates were set to facilitate coordination [43] <ul style="list-style-type: none"> • Parents involved/parental support [20, 32, 35, 39, 41] • Change of session delivery—Reducing sessions for parents, providing evening session and combining session [20] • Increased community awareness—increased engagement with service and fundraising opportunity [21] • Adults supporting the child/Teachers able to be in session with the children [24, 25] <ul style="list-style-type: none"> • Strong therapeutic relationships [25] • Sensitivity to cultural and socioeconomic diversity [39] <ul style="list-style-type: none"> • Engagement of teachers [28] • Integration with already available services [41] • Parent–child interactions [30] • Other organisations have become aware of the value of these initiatives [22] • The key elements of success are the strong commitment from the services, the people involved and the ongoing engagement by families [22].
	Use of local environments	<ul style="list-style-type: none"> • Visiting clinics—Access to services was provided closer to home [33, 36] <ul style="list-style-type: none"> • Tailored interventions (tailored to needs and choice on location) [19] <ul style="list-style-type: none"> • Conducted in homes/community [43] • Sessions conducted at school [20, 23, 28] <ul style="list-style-type: none"> • Home environment [21, 35, 42] • Access to a classroom [24] • Conducted in school [37] • Remote site closer to the child's location [40] <ul style="list-style-type: none"> • Colocation of services in schools [41] • Sessions conducted at school with support of aide [29] • Sessions/assessments delivered at home or at school [30] <ul style="list-style-type: none"> • Education clinic brought into town [31] • Home environment was nonthreatening [32] • Familiar environment for the child [38] • Online service in the child's environment—no need for transportation [34].
Improved resourcing	Positive use of technology	<ul style="list-style-type: none"> • Online websites for teacher training and development [20] • In-person assessments (accompanying an online service) [24] • Clients were motivated/Motivated by online services [25, 40] <ul style="list-style-type: none"> • Online services can bring staff into [rural areas] [32] • Telephone support to continue with the programme [42].
	Improved resourcing	<ul style="list-style-type: none"> • Referrals were reviewed against guidelines [36] • Inclusion in policy and funding frameworks (in NDIS) [19] <ul style="list-style-type: none"> • Funded by philanthropists and government [21, 33] • Reports included recommendations for staff and parents [23] <ul style="list-style-type: none"> • Value-adding initiatives (funding opportunities) [28] <ul style="list-style-type: none"> • Satisfaction with resources [31] • Gaps in service was highlighted [33] • Training materials (self-help books) designed [42].

(Continues)

TABLE 2 | (Continued)

	Optimisation of family-focused service delivery	<ul style="list-style-type: none"> • Frequent/consistent services [24, 25, 32, 35] <ul style="list-style-type: none"> • Flexible services [25, 34] • Children and families appeared highly engaged [39] • Preparedness (enabled AHPs to change their approach when needed, implementing back up plans to engage children or to overcome technology issues) [25] <ul style="list-style-type: none"> • ‘Preference assessment’—Targeted problem behaviours and identification of highly preferred toy [26] • Referral, intake, allocation processes in place [27] <ul style="list-style-type: none"> • Adaptations/developmental evaluation [28] • (More sustained effects for) students receiving therapy services over multiple semesters [29] <ul style="list-style-type: none"> • Shorter sessions (more time efficient) [34] • Program specific adaptations (see extraction) [35] <ul style="list-style-type: none"> • Length of session (90mins) [35] • ‘traffic controller’ to support parents make their way through the circuit/service [38] <ul style="list-style-type: none"> • Child friendly set-up [38].
Alternate workforce strategies		<ul style="list-style-type: none"> • Transdisciplinary team/model [36] <ul style="list-style-type: none"> • Establishing a local presence [19] • Different perspectives/Interdisciplinary ‘detection team’ [43] <ul style="list-style-type: none"> • Use of graduates [20] • Use of a transdisciplinary ‘key worker’ [21] • Partnership between schools, university and university clinical schools and agreement on working collaboratively on delivering the programme [22] <ul style="list-style-type: none"> • Hands-off supervision led to students demonstrating rapid growth [23] • Stepping outside traditional professional boundaries—substitute health professional (speech vs. psychology) was acceptable [37, 42] <ul style="list-style-type: none"> • Role of physical therapist as the programme designers [39] • More than one team member working with each child (working towards shared NDIS goals) [27] <ul style="list-style-type: none"> • Cross-sector collaboration/Discipline engagement [28] <ul style="list-style-type: none"> • Staffing and supervision [28] • Development of skills [30] • Strengthened partnerships between health, education and disability services [33] <ul style="list-style-type: none"> • Partnerships with local department of education services [38].
Capacity-building supports		<ul style="list-style-type: none"> • Collaborative team/appropriate support and oversight from this team/interdisciplinary practice [19] <ul style="list-style-type: none"> • Teachers were responsive to service [23] <ul style="list-style-type: none"> • Combining teacher and [speech therapist] expertise [37, 42] • Indirect role of therapist to support the team around the child [39] • Strong clinical reasoning, communication and collaboration [25] • Use of two-layered coaching approach (i.e., expert—local therapist—parent/carer) [26] <ul style="list-style-type: none"> • Access to aides/allied health assistants/trained facilitators to be in the room when delivering teletherapy services [40] <ul style="list-style-type: none"> • Capacity-building focus [27] • Provided with access to autism specialist [27] • Model expansion: more participating universities [28] • Positive relationship building between parents and staff [30, 31] <ul style="list-style-type: none"> • Satisfaction with (clinic staff) [31] • Families like the content delivered [32] • Families have control of the service (time, pace, frequency and repetition) [32] <ul style="list-style-type: none"> • Consultative therapists for parents [32] • Increased capacity of local health and education personnel [33] <ul style="list-style-type: none"> • Built in parent support [35] • Parents given verbal and written feedback and opportunity to ask questions [38].
Optimisation of factors related to the child	Optimisation of factors related to the child	<ul style="list-style-type: none"> • ‘Preference assessment’—Targeted problem behaviours and identification of highly preferred toy [26] <ul style="list-style-type: none"> • Clients who were able to focus and attend to task [40].

(Continues)

TABLE 2 | (Continued)

Barriers themed	
Theme	Data
Challenges with partnerships	<ul style="list-style-type: none"> • Building relationships from scratch with therapists [19] <ul style="list-style-type: none"> • COVID lockdowns [19] • Parental compliance with service [20] • Aboriginal Children—cultural and language barriers [22] • Communication between the team around the child [24] <ul style="list-style-type: none"> • Limited time for teachers [37] • Children missing out on class time [37] • Parents reducing involvement/responsibility/parental engagement [28, 37] • Biological parents not being main caregivers (i.e., grandparents were main carers in the areas making adherence difficult) [39] • Higher education (bringing higher education to work alongside rural communities) [28] <ul style="list-style-type: none"> • Cross-sector collaborations [28] • Balancing community expectations with government requirements [28] • Need to negotiate with universities, schools and local health services [41] <ul style="list-style-type: none"> • Parents having insufficient time to complete therapy tasks [30] • Social and behavioural challenges (within family, challenging parents to complete sessions) [30, 42] <ul style="list-style-type: none"> • Parental health literacy [31] • Lack of service knowledge/confusion around expected outcomes [31] <ul style="list-style-type: none"> • More knowledge ('warning signs') on disabilities [32] • Involving children [32] • More information and training for home visits/involving parents in training [32] <ul style="list-style-type: none"> • Engaging families [32] • Onsite assistance (needed) for home visits [32] • Lack of interest due to small communities [32] <ul style="list-style-type: none"> • Longer wait lists in local services [33] • No onsite services provided [34] • Attrition of parents over extended period of time—extended time of programme [35] <ul style="list-style-type: none"> • Cultural challenges—specific community needs [38]
Challenges for the health workforce	<ul style="list-style-type: none"> • Follow-up to services [36] • Administrative tasks/more admin support [19, 32, 33] <ul style="list-style-type: none"> • Isolation of job [19] • No career progression path/health workforce development [19] <ul style="list-style-type: none"> • Variation in training of allied health assistants [19] <ul style="list-style-type: none"> • Retention [19] • Lack of role recognition (i.e., importance of the service) [19] • Process of 'early detection' is quite time-consuming [43] • Distance to travel (for allied health professionals) [21] <ul style="list-style-type: none"> • Availability of professionals [39] • Scheduling and staffing challenges [27] • Increased workload on local staff [33]
Physical or financial resource availability	<ul style="list-style-type: none"> • (Otitis Media) Diagnostic criteria changed/were tightened [36] • Targets/billing pressures/lack of billable supports or guidelines [19] <ul style="list-style-type: none"> • Inadequate remuneration [19] • Limited funding for aide time = Limited number of students able to receive service [37] <ul style="list-style-type: none"> • Economic challenges of the area [39] <ul style="list-style-type: none"> • Policy and funding [28, 41] • Service-learning/valid educational pedagogy [28] <ul style="list-style-type: none"> • Higher cost of clinical placements [41] <ul style="list-style-type: none"> • No validated teacher scale [29] • Activities to increase accessibility [for severely handicapped children/Sign language/adaptive physical activity] [32] <ul style="list-style-type: none"> • More information on local resources [32] • Funding for locally based clinical educator support [22].

(Continues)

TABLE 2 | (Continued)

Technology challenges	<ul style="list-style-type: none"> • Technology challenges (including sound equipment, compatible computers, assistance needed for software, slow internet connection) [24, 25, 27, 32, 34, 40] • Delivering goals where physical interaction was required (for online services) [27, 32] <ul style="list-style-type: none"> • (for computerised programs) contact info for help/assistance in setting up [32] <ul style="list-style-type: none"> • Providing videos (online services) [32] • Parents and teachers may be reluctant to use technology [34]
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funding opportunities [21, 28, 33], delivering reports [23] training materials [42] and satisfaction with resources [31]. ‘Positive use of technology’ included the use of technology for training and support [20, 42], in-person assessments to accompany online services [24] and clients being motivated by online services [25, 40]. Finally, ‘optimisation of factors related to the child’ reported the ‘use of a preference assessment’ (i.e., finding out what the child liked) [26] while another citation reported that having cooperative clients was beneficial for service delivery [40].

‘Capacity-building supports’ were reported in 16 citations [19, 23, 25–28, 30–33, 35, 37–40, 42]. These were described as supports that empowered others to deliver key elements of screening/therapy. These strategies often included supporting teaching staff to deliver therapy programmes in the classroom [33, 37, 42], educating parents such as how to support their child with autism and deliver therapy sessions at home [26, 31, 32, 35, 38, 39], collaborative allied health teams that included providing expert support for local health personnel (i.e., autism specialists) [19, 25–27, 33, 40] and expanding models to increase university placements that involve students [28].

‘Alternate workforce strategies’ were also frequently reported as enabling strategies for delivery of new MoC ($n=15$) [19–23, 27, 28, 30, 33, 36–39, 42, 43]. These strategies included transdisciplinary teams where professionals could step out of traditional professional boundaries [37, 42], increasing partnerships between different professionals [19], including different AHP perspectives in the design and delivery of a new MoC [27, 36, 43], using graduates or students [20, 22], and the use of key workers in the team [21, 39].

3.3 | Barriers to Delivery of New MoC

Fifty-five individual barriers to the delivery of new MoC were identified across the included citations and were organised into four themes (Table 2; Data S4). These included; ‘challenges with partnerships’ ($n=16$) [19, 20, 22, 24, 28, 30–35, 37–39, 41, 42]; ‘challenges for the health workforce’ ($n=10$) [19, 21, 27, 28, 32, 33, 36, 37, 39, 43]; ‘physical or financial resource availability’ ($n=8$) [19, 22, 28, 29, 32, 36, 37, 39, 41] and ‘technology’ ($n=6$) [24, 25, 27, 32, 34, 40].

The theme of ‘challenges with partnerships’ was the most frequently reported barrier to delivery of a new MoC ($n=16$) [19, 20, 22, 24, 28, 30–35, 37–39, 41, 42], and covered issues faced by members of the team around the child (TAC) and the community. One of the most reported partnership challenges was ‘parental compliance’ [20, 28, 32, 35, 37, 39]. It was noted

that parents/carers and teachers had insufficient time [30, 37], competing external family challenges [30, 42] or reported they received insufficient training to deliver care [32]. Difficulties for families to build relationships and communicate with therapists was also a commonly reported barrier [19, 24]. When the MoC included services delivered in the classroom (involving education staff or providing strategies to education staff), barriers included teachers having limited time to engage with therapists and children missing out on classroom activities [37]. From a community perspective, barriers to delivering care relating to ‘challenges with partnerships’ were extensive. These included; lower health literacy of families/others partnering in care delivery and poor understanding of the need for and function of the service [31, 32], cultural barriers [22, 38], a lack of local services for onsite delivery (for teletherapy services) [34] and difficulty with relationships between sectors (including universities and schools) [28, 41]. One citation identified that introducing a screening service increased the waiting time for local services [33]. COVID pandemic-related lockdowns of 2020/21 were also noted as a barrier for engaging with the community [19].

‘Challenges for the health workforce’ ($n=10$) [19, 21, 27, 28, 32, 33, 36, 37, 39, 43] focused on the specific issues confronted by the AHPs involved in service delivery. These included elements such as difficulty with providing follow-up appointments [36], increased administrative loads [19, 32, 33], isolation [19], lack of career progression [19, 28] variation in training [19], long distances to travel [21] and a lack of role recognition [19] and the availability and capacity of staff to deliver the new MoC [19, 23, 27, 37, 39]. This contributed to poor retention of AHPs in the local area [19, 37].

‘Physical or financial resource availability’ was described in $n=9$ citations [19, 22, 28, 29, 32, 36, 37, 39, 41]. There were challenges linked to diagnostic criteria described in one citation [36] where a change in diagnostic criteria altered who was available for a service. Another citation [28] had difficulty with utilising an appropriate teaching strategies for the community [28]. Additionally, there were challenges with attaining funding due to policy restrictions [28, 41], higher costs when providing student placements [41], having sufficient funding for clinical educators [22], limited funding and time for aides [37], difficulty with inadequate remuneration for staff [19] and billing pressures from business needing to ensure sufficient revenue is generated to cover the cost of providing the new MoC [19]. One citation reported that lower socioeconomic status in the area affected the implementation, but it was unclear what [39]. Finally, one citation [32] discussed physical resources such as accessibility for those with physical disabilities or the ability to use alternate communication.

The service delivery barrier of ‘technology challenges’ was reported in $n=6$ citations [24, 25, 27, 32, 34, 40]. These generally included difficulties with equipment, compatibility of computers, and slow internet connection [24, 27, 32, 34, 39, 40]. Equipment challenges related to access to technological equipment (e.g., sound equipment and webcams) and extended to challenges ensuring the TAC is supported to use this equipment and therefore can access the online services [32]. Additionally, the delivery of goals where physical interaction was required was reported as a barrier to online service delivery [27, 32]. Finally, one citation also reported reluctance from parents and teachers to use the technology [34].

3.4 | Relationship Between MoC, Drivers, Enabling Strategies and Barriers to Delivery of New MoC (Logic Model)

Figure 2 displays the frequency of enabling strategies, as reported by citations from the literature, utilised to overcome drivers. Irrespective of the driver, the most consistently used enabling strategy was the ‘use of local resources (place-based resources)’. Additionally, ‘capacity-building supports’ were used in all citations addressing the driver of ‘long waiting lists’. The least commonly used enabling strategy was ‘optimisation of factors related to the child’.

The frequency of barriers, occurring when addressing drivers, can be found in Figure 3. The most common barrier was ‘challenges with partnerships’, while the least common was ‘technology challenges’.

3.4.1 | Models of Care Designed to Address ‘Inadequate Services’

Where ‘inadequate services’ were reported as the driver for the delivery of a new MoC, role substitution or online services were most commonly delivered. Across these MoC, the most common enabling strategy for their delivery was reported as ‘place-based approaches’ followed closely by ‘capacity-building supports’ and ‘multi-disciplinary approaches’. ‘Challenges with partnerships’ was the most commonly reported barrier to delivery of a new MoC where inadequate services were the driver.

3.4.2 | Models of Care Designed to Address ‘Extensive Travel’

Where ‘extensive travel’ was reported as the driver, all MoC were used with role substitution found to be the most common MoC used to address this driver. All citations described ‘use of local environments’ such as services delivered in the child’s environment (and not in a clinic setting), as the most prominent enabling strategy underpinning their delivery. Additionally, where ‘extensive travel’ was the key driver for the MoC, regardless of the type of MoC, the enabling strategy of ‘alternate workforce strategies’ was reported frequently (seven of the eight citations) [19, 20, 23, 27, 36–38]. Barriers to delivery of MoC to address travel challenges most commonly related to ‘challenges for the health workforce’ and ‘challenges with partnerships’. In particular, barriers relating to ‘partnerships’ most frequently related to challenges engaging parents to comply with therapy and trying to engage already

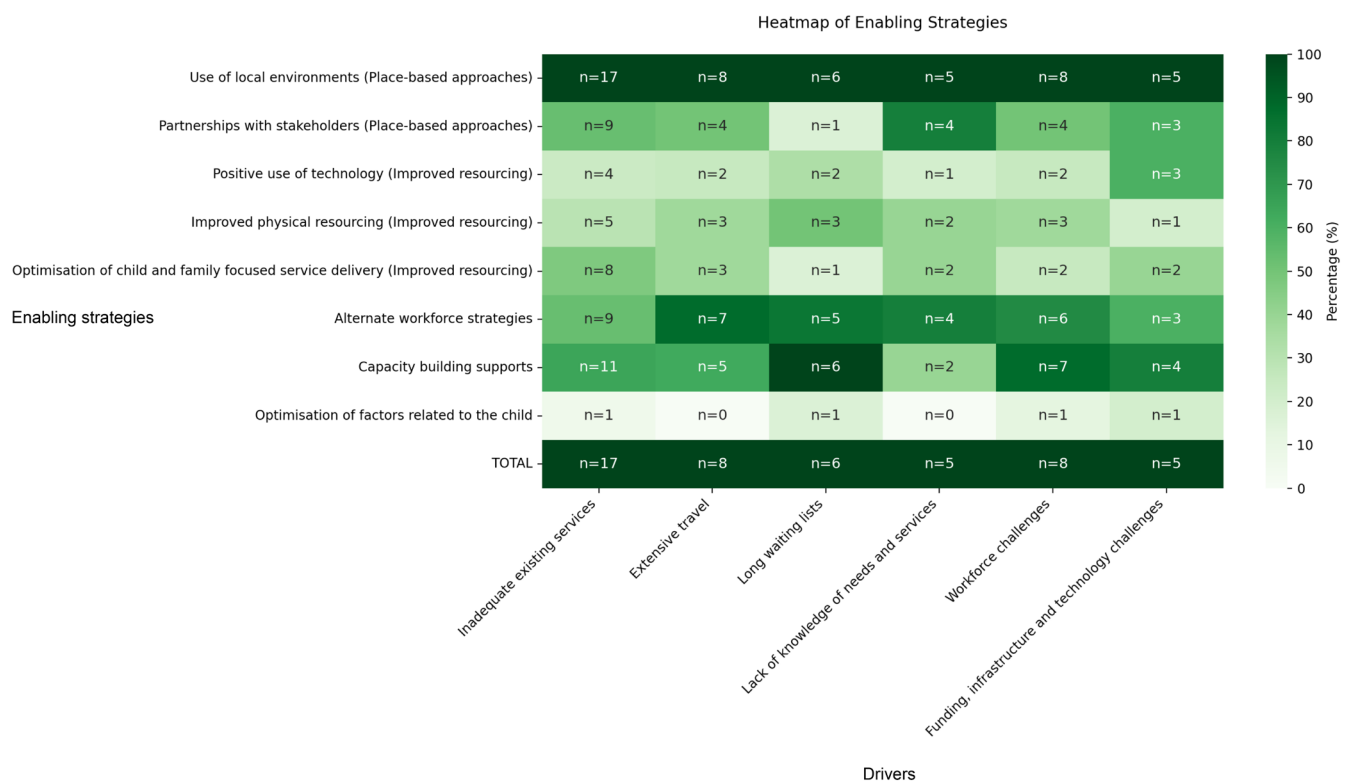


FIGURE 2 | Heatmap of enabling strategies against drivers.

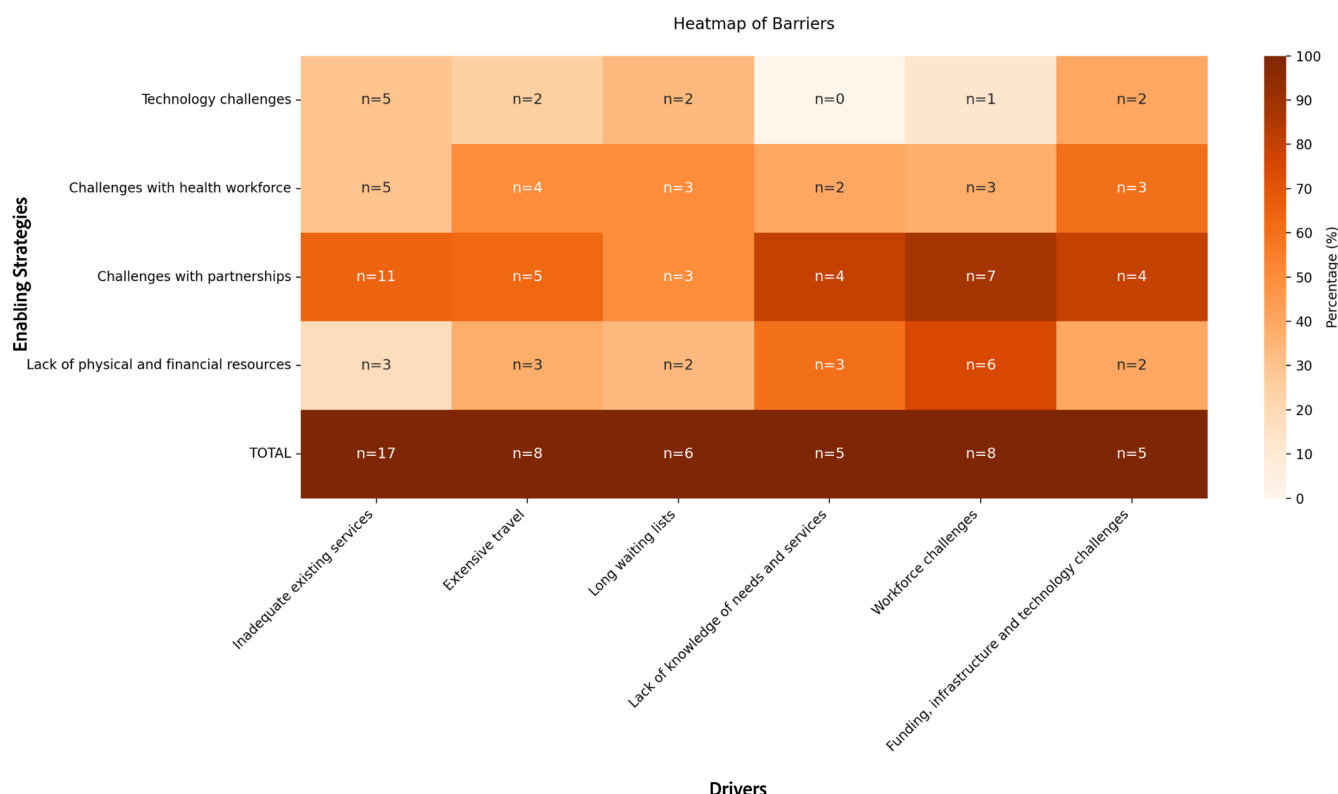


FIGURE 3 | Heatmap of barriers against drivers.

overburdened school staff. This suggests a mismatch between enabling strategies such as ‘alternate workforce strategies’ and ‘place-based approaches’, while barriers identified were ‘challenges for the workforce’ and ‘challenges with partnerships’. This highlights the complexities around service delivery within rural and remote areas.

Where a MoC is designed to address challenges with ‘extensive-travel’, it appears most important to consider designing the service to be delivered in the child’s environment. However, for this to be successful, challenges faced by the AHP workforce, who may be tasked with delivering the care in ways that are different to their usual ways of working, would need to be attended to as well as addressing challenges related to involving families and other partners in the delivery of care.

3.4.3 | Models of Care Designed to Address ‘Challenges for the Health Workforce’

Where ‘challenges for the health workforce’ were reported as the driver for the delivery of a new MoC, role substitution was the MoC most commonly delivered. Across these MoC, the most common enabling strategy for their delivery was reported as attending to ‘use of local environments’. Following this, ‘capacity-building supports’ and ‘alternate workforce strategies’ were the most commonly described enabling strategies. The most commonly reported barrier to delivery of MoC designed to address health workforce issues was challenges with partnerships, in particular trying to engage already overburdened families and teachers, as well as supporting AHPs to work within inter and transdisciplinary approaches. Where a MoC is designed to

address challenges related to health workforce, for delivery to be successful, it appears it is most important to attend to enabling contexts; strategies to address partnership challenges; and strategies to support new ways of working for AHPs delivering the service (e.g., inter- and transprofessional working).

3.4.4 | Models of Care to Address ‘Knowledge of Needs and Services’

Where challenges with knowledge of needs and services were reported as the driver for the delivery of a new MoC, screening services, consultative services and role substitution MoC were most commonly delivered. These MoC reported ‘use of local environments’ as a key enabling strategy and all but one citation [38] described the importance of partnerships to the delivery of these new MoC, in particular the use of ‘alternate workforce strategies’. Relatedly, all but one of these MoC described ‘challenges with partnerships’ as their key barrier to service delivery with engaging parents in their child’s care (compliance) the most frequently reported partnership challenge followed closely by understanding cultural complexities of a community. To deliver MoC designed to address challenges related to ‘knowledge of and the need for services’, attention should be given to strategies to deliver services that involve the ‘use of local environments’ as well as enhancing parental and community relationships.

3.4.5 | Models of Care to Address ‘Long Waiting Lists’

Where the driver for a new MoC was reported as addressing long waiting lists, consultative services, role substitution and

online services were the MoC used. None of the screening service MoC mentioned 'long waiting lists' as a driver for implementing the new MoC. All citations describing 'long waiting lists' as a driver for the new MoC did report 'capacity-building supports' and 'place-based approaches' as enabling strategies. Specifically, 'place-based approaches' most commonly related to the physical environment in which a service was delivered. MoC to address 'long waiting lists' were delivered either in the child's home, online, or in an education centre. 'Alternative workforce strategies' were also reported as an enabling strategy in all but one citation. The most commonly reported barrier to delivering MoC to address 'long waiting lists' was 'challenges for the AHP workforce' who are delivering the MoC and involved in partnerships. To deliver MoC designed to address 'long waiting lists', attention should be given to strategies that enable place-based approaches; strategies that enhance partnerships and relationships with and between families, community members, health professionals and other staff involved in delivery of the MoC; as well as strategies to support new ways of working for AHPs delivering the service.

3.4.6 | Models of Care to Address 'Low Resources'

All MoC examined reported addressing 'low resources' as a driver for their implementation. 'Use of local environments' was reported by all citations as a core enabling strategy, followed by 'capacity-building' style supports. The most common barriers related to delivering MoC to address 'low resources' were 'challenges for the health workforce' delivering the MoC and 'partnership challenges'. To deliver MoC designed to address 'low resources', attention should be given to strategies that facilitate 'use of local environments' and building the capacity of those involved in the MoC alongside strategies to enhance partnerships and strategies to support new ways of working for AHPs delivering the service.

A summary of the themes identified can be found in Table 3.

4 | Discussion

This scoping review has explored the drivers for, barriers to and enabling strategies that may assist in the delivery of new MoC designed to improve the quality of child development allied health services in rural and remote areas. In bringing these elements together, this review has attempted to identify what a community or health service may need to consider if it wants to design and deliver a new MoC to address quality of care issues for rural children.

Place-based strategies were the most commonly reported enabling strategy within this review. This is not unexpected because this approach is recommended across the literature when addressing rural health needs in other populations [44]. However, to ensure the best chance of success, place-based strategies need to ensure there is agreement between community need and the driver (or motivation) for the MoC. Four elements have been identified within the literature as key to successful place-based MoC [45]: (1) Examining local knowledge (local residents lived experiences and also understanding

local resources); (2) identifying the right policy mix (local and broadly focused); (3) understanding collaborative governance; and (4) recognising the roles of local governments. Models of successful community-led, place-based care have been described in the literature relating to other healthcare disciplines [46]. For example, one rural town in Victoria, Australia, worked together to develop a fund to provide general practitioners coming to the town with housing, mentoring and community support [47]. This example as well as the importance of place-based care for our population group, identified by this research, demonstrates the importance of supporting communities to identify and then be supported to partner with healthcare providers and healthcare providing organisations to collaboratively address the complex factors that create barriers to accessing healthcare in their own community.

It is evident from this review that a deep understanding of the community—including their needs and assets, is essential for delivery of quality allied health MoC for children with developmental needs in rural areas. Despite an intention to deliver 'better' care, this review highlights that realising this aspiration was often stymied due to a mismatch between what the community had capacity for and what the MoC required to be successfully delivered within that community. Examples of this included online MoC where the community did not have the physical technology resources to support its delivery [27]; using parent-led therapy MoC where the parents did not have the capacity to fully participate in the service [31]; and implementing MoC that are time-consuming for already overburdened health professionals responsible for delivering the new MoC [43]. Where a MoC was designed to address the issue of 'inadequate services', it appeared important to consider the use of partnerships with not just AHPs but also those within the community. This highlights the importance of first understanding what a community needs and wants, then exploring a community's capacity to receive a new MoC (by examining community assets for example) and finally identifying the communities assets. These assessments can consider social processes (such as the way people interact and create social norms) that are already in place, that may impact the delivery of healthcare [47].

While this review, and other research, identifies community-led identification of needs and assets as key to successful delivery of new allied health MoC for children with developmental needs in rural areas, service delivery can also be complicated by often poor health and health workforce literacy in rural communities [48]. 'Knowledge of needs and services' was a driver identified in this review for delivering a new MoC. This driver describes MoC designed to address health literacy and health-seeking behaviours as well as improving knowledge of existing services. In Levesque's framework of healthcare access [49], knowledge of health needs and of someone's ability to perceive health challenges, underpins the framework. Levesque, Harris and Russell [49] describes that understanding one's own health needs underpins healthcare seeking and healthcare utilisation behaviours. As such, if an understanding of health needs is lacking, the likelihood of accessing a particular healthcare service, whether it is available in an area or not, is low. Therefore, it is challenging to undertake an accurate needs assessment within a community if that community is unable to fully understand its own health needs. This review confirms these observations.

and health literacy within the communities. Additionally, we must also consider children when considering end-user perspectives of services delivered to this population. While there may be challenges in engaging with rural communities and children, understanding these perspectives is critical when designing and implementing new MoC and optimising outcomes.

Author Contributions

Georgia Gosse: conceptualization, investigation, writing – original draft, methodology, visualization, writing – review and editing, formal analysis, project administration, data curation. **Saravana Kumar:** supervision, resources, writing – review and editing, methodology, conceptualization. **Helen Banwell:** methodology, supervision, writing – review and editing, conceptualization. **Anna Moran:** conceptualization, writing – review and editing, methodology, supervision.

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Conflicts of Interest

The authors declare no conflicts of interest.

Data Availability Statement

The data that supports the findings of this study are available in the Supporting Information of this article.

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Supporting Information

Additional supporting information can be found online in the Supporting Information section.