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A realist review to explore how midwifery continuity of care may influence preterm birth in pregnant women

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Abstract

Background: Midwifery continuity of care models are the only health system intervention associated with both a reduction in preterm birth (PTB) and an improvement in perinatal survival; however, questions remain about the mechanisms by which such positive outcomes are achieved. We aimed to uncover theories of change by which we can postulate how and why continuity of midwifery care models might affect PTB.

Methods: We followed Pawson's guidance for conducting a realist review and performed a comprehensive search to identify existing literature exploring the impact of continuity models on PTB in all pregnant women. A realist methodology was used to uncover the context (C), mechanisms (M), and outcomes (O) and to develop a group of CMO configurations to illuminate middle-range theories.

Results: Eleven papers were included from a wide variety of settings in the United Kingdom, Australia, and the United States. The majority of study participants had low socioeconomic status or social risk factors and received diverse models of midwifery continuity of care. Three themes—woman-midwife partnership, maternity pathways and processes, and system resources—encompassed ten CMO configurations. Building relationships, trust, confidence, and advocacy resulted in women feeling safer, less stressed, and more secure and respected, and encouraged them to access and engage in antenatal care with more opportunities for early prevention and diagnosis of complications, which facilitated effective management when compliance to guidelines was ensured. Organizational infrastructure, innovative partnerships, and robust community systems are crucial to overcome barriers, address women's complex needs, ensure quality of care, and reduce PTB risk.

Conclusions: Pregnant women living in different contexts in the United Kingdom, Australia, and the United States at low and mixed risk of complications and with low socioeconomic status or social risk factors experienced continuity models in similar ways, and similar underlying mechanisms may have influenced PTB outcomes. Further research is required to understand how continuity models may influence

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behavioral change, physiological stress levels, ethnic disparities in PTB and care coordination, and navigation of health services.

KEYWORDS
continuity of care, preterm birth, realist review

1 | INTRODUCTION

The term preterm birth (PTB) is used to define any birth before 37 weeks' completed gestation. One in ten babies worldwide are born too soon, and more than one million die each year from complications related to their prematurity.[1] Although many preterm babies survive, they are susceptible to adverse health outcomes and disabilities, which have a profound and long-lasting impact on families, societies, and health systems.[2] Despite multiple efforts to reduce its prevalence, improve management and survival, and reduce neonatal mortality and morbidity, it is evident in countries where there are reliable data that PTB continues to rise.[3] Most PTBs are spontaneous because of preterm prelabor rupture of membranes (PPROM) or spontaneous onset of labor, and only a small part are iatrogenic or practitioner-initiated for fetal or maternal reasons. However, the cause of spontaneous PTBs is unknown in up to half of the cases and may involve a wide variety of complex and overlapping factors ranging from chronic diseases, infections, and poor obstetric history (eg, previous PTB or late miscarriages), anxiety, psychosocial stress, unhealthy diet, smoking, substance use disorder, and domestic or gender-based violence.[4] As a result of this complexity, effective interventions and public health strategies to prevent PTB have been hard to achieve.

More recently, a Cochrane Review of Reviews reported that midwifery continuity of care models for pregnant women who were at low and mixed risk of complications were the only interventions shown to both reduce PTB and improve perinatal survival.[5] Sandall and colleagues reported that women who receive care by a named midwife or a small group of midwives throughout pregnancy, birth, and the postnatal period are 24% less likely to experience a PTB; 16% less likely to lose their babies before 24 weeks of gestation; more likely to have better maternal and infant outcomes; and more likely to report positive experiences of care.[6] However, questions remain about the causal mechanisms behind the reduction of PTBs in continuity models. Models of care are complex interventions and require theoretical modeling of the relationships between context, processes, and outcomes; research is also required on how these models might contribute to preventing PTB before generalizing the results to a population with health complications.[5,6]

Midwifery continuity of care was identified in the World Health Organization (WHO) guidance for antenatal and intrapartum care and has influenced maternal policy globally.[7-10] The National Health Service (NHS) Long Term Plan was published by the United Kingdom government to guide how the NHS will develop over the next decade. This report included recommendations that most women should be offered continuity of care throughout their pregnancy, during birth, and postnatally by March 2021.[7] Complex interventions, such as continuity models, are composed of multiple and different interacting components, and nonlinear causal pathways.[11] Thus, the effect that a complex intervention can have on an outcome is highly dependent on the context in which it takes place and how successfully it has been implemented. Our review aimed to explore how midwifery continuity of care models may influence maternity care services and women's experiences, and to examine what impact this has on PTB outcomes in different contexts.

2 | METHODS

Traditional systematic reviews focus on measuring and reporting the effectiveness of interventions, and often provide little or no information as to how and why the intervention worked or did not work and for whom.[12] In addition, when complex interventions fail to achieve their desired outcomes, the explanation for failure often lies with the complexity or context-dependent nature of the intervention itself. This lack of understanding leads to challenges in development, implementation, and scaling up of similar complex interventions. Realist systematic reviews are specifically designed for complex policy interventions and take a theory-driven approach to explore underlying mechanisms of how, why, and in what circumstances complex interventions succeed or fail.[12] A realist approach considers that the intervention works (or does not work) because certain choices or decisions are made in response to that intervention (or not); it is this human reasoning in response to the resources and opportunities facilitated by the intervention that actually influences the outcome/s. Context, however, also influences human reasoning, and mechanisms might only work under specific circumstances.[13] A realist approach uses context-mechanism-outcome (CMO) configurations to reflect the importance of mechanisms (as they produce outcomes) and the context (as this influences the processes by which an intervention generates an outcome).[14]

TABLE 1 Summary of inclusion and exclusion criteria

	Inclusion criteria	Exclusion criteria
Participants	All pregnant women (regardless of age, ethnicity, socioeconomic status, and medical or obstetric risk).	None
Intervention	Models of midwifery continuity of care across the antenatal, intrapartum, and postnatal continuum. Planning, organization, and delivery of comprehensive maternity care by one named midwife or a small group of midwives to a woman from the initial booking to the postnatal period. Delivered in community, at hospital, or within home settings by professionally qualified midwives or nurse-midwives.	Midwifery continuity of care only for defined periods, such as during only the antenatal or postnatal periods. Nonprofessionally qualified midwives or nurse-midwives.
Comparison	If applicable, any (eg, standard care, physician-, or obstetrician-led models)	None
Outcome	PTB defined using WHO criteria: birth before 37 weeks of completed gestation) regardless of spontaneous or iatrogenic nature. Potential mechanisms, explanations, or theories of how and why continuity of care models affected PTB (positively or negatively) explored or assumed by study authors, participants, or stakeholders.	No report of PTB outcomes or PTB reported with different cutoffs. Potential mechanisms not explicitly related to PTB.
Study design	Any (eg, quantitative randomized and nonrandomized studies, quantitative descriptive studies, mixed-methods studies) No limits to language, date of publication, or country.	Secondary research conceptual pieces such as commentaries or systematic reviews

This methodology is therefore well matched to our aim of recognizing the complexity of midwifery continuity of care models and of synthesizing middle-range program theories that are specific enough to generate hypotheses that may explain how this intervention works to achieve its outcomes. In our study, mechanisms refer to the processes that shape how women react, interpret, and act on the opportunities and resources provided by the continuity model, which then influences decisions and choices that affect PTB in a specific context. Context refers to the larger environment surrounding the continuity model that acts on specific mechanisms to influence prematurity. Lastly, outcomes refer to the multiple consequences of the model (both planned and unplanned), resulting from different mechanisms being triggered in multiple contexts.[13]

We applied Pawson's guidance and RAMESES publication standards for realist reviews to focus on understanding how and why an intervention works and unearthing, often hidden, mechanisms.[14] These include the following: (a) clarification of the scope of the review; (b) search of evidence; (c) selection and appraisal of primary studies; (d) extraction and organization of data; and (e) synthesis of the evidence and drawing of conclusions through a process of reasoning.

2.1 | Clarification of the scope of the review

We aimed to uncover important theories of change or mechanisms by which we can postulate how and why midwifery continuity of care models might affect PTB. Involvement of key stakeholders is crucial for realist reviews.[12] Thus, we regularly collaborated with maternity service users with risk factors for PTB, and global experts in continuity models and realist methodology, who advised on scope and CMO synthesis. The review was guided by one main question: How do midwifery continuity of care models reduce PTB—for whom, how, and in what circumstances?

2.2 | Search of evidence

Inclusion and exclusion criteria were defined using the PICOS approach—Population, Interventions, Comparators, Outcomes, and Study designs (Table 1). In keeping with the nature of a realist synthesis, quantitative, qualitative, and mixed-methods studies reporting on the potential impact of midwifery continuity of antenatal, intrapartum, and postnatal care for all pregnant women and PTB, regardless of the language, date of publication, or country, were included to address the research question. This flexible approach allows for the complexity of contexts and potential mechanisms of causation to be captured. Studies were eligible for inclusion if they included pregnant women regardless of their age, ethnicity, socioeconomic status, and medical or obstetric risk. Studies testing, evaluating, or exploring midwifery continuity of care models throughout pregnancy, birth, and the postnatal period were included. The intervention had to involve the planning, organization, and delivery of comprehensive maternity care by one named midwife or a small group of midwives (professionally qualified) to a woman from the early antenatal care through to the postnatal period and delivered in community, at hospital, or within home settings. Studies that involved continuity of care only for defined

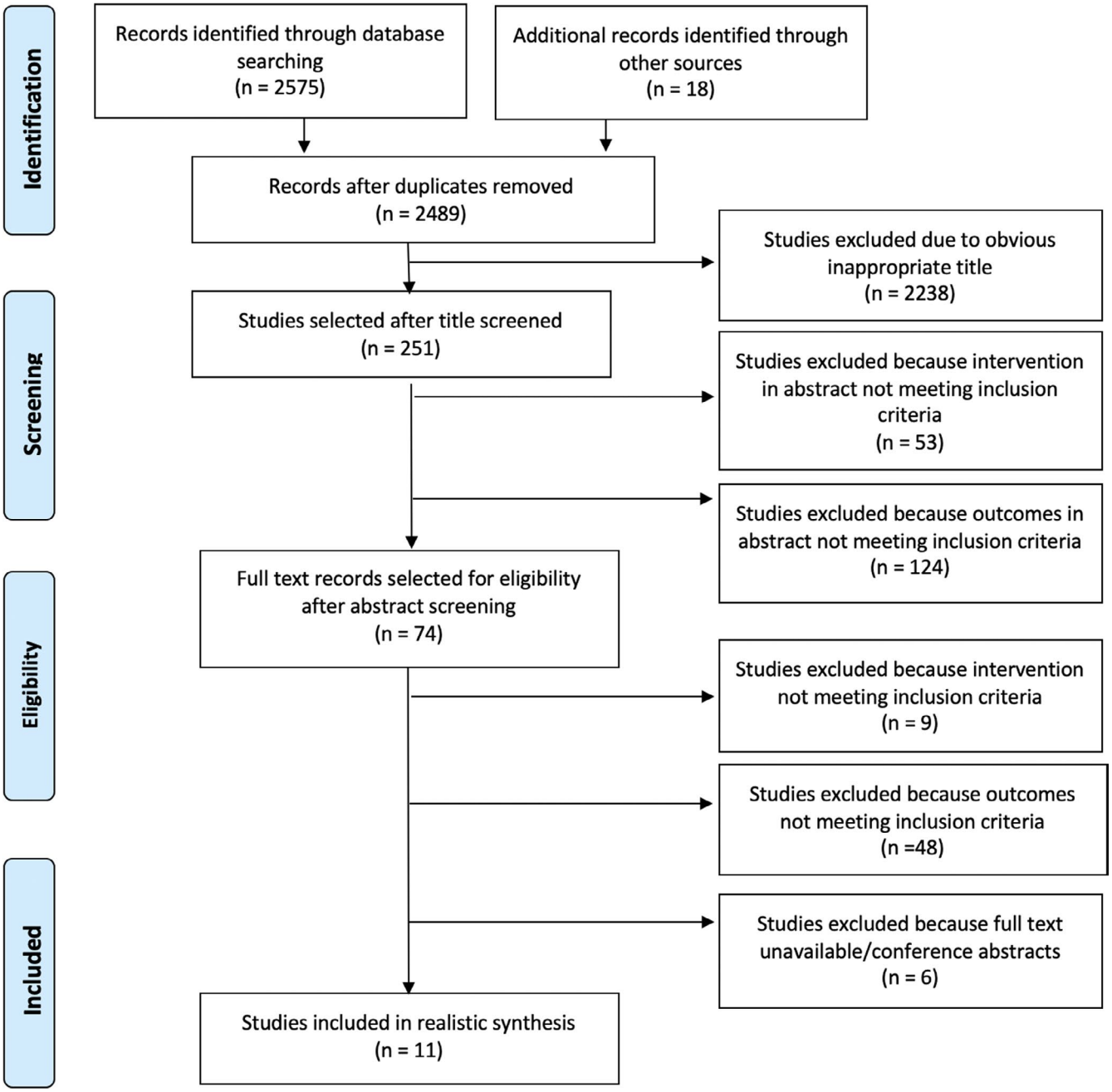

FIGURE 1 PRISMA flow diagram [Color figure can be viewed at wileyonlinelibrary.com]

periods, such as during the antenatal or postnatal periods alone, were excluded. Studies were only included if PTB was defined using the WHO criteria (birth before 37 weeks of completed gestation) regardless of spontaneous or iatrogenic nature, and whether potential mechanisms, explanations, or theories of how continuity models affected PTB (whether positively or negatively) were explored or assumed by study authors, participants, or stakeholders. Studies reporting potential mechanisms not explicitly related to PTB were excluded.

We systematically searched the following electronic databases, with no language, setting, or time limits set, for published studies through December 12, 2019: MEDLINE, Embase, CENTRAL, CINAHL, PsycINFO, Web of Science, and BNI. Limitations for human studies were applied to each database. Search terms, keywords, and strategies, which were reviewed by an information specialist, are presented in Supporting Information 1. Furthermore, we searched PubMed, Google Scholar, PROSPERO, and Scopus; we also hand-searched bibliography and reference lists of the studies included in ours and others' reviews to locate additional studies. We also searched the Australian New Zealand Clinical Trials Registry and the US Clinical Trials Registry for unpublished and ongoing trials.

2.3 | Selection and appraisal of primary studies

We selected studies in two stages. First, titles and abstracts were screened by the first author (CFT) who excluded citations that had obviously irrelevant titles or were not related to midwifery continuity of care or PTB. Second, the full report of potentially relevant studies was checked for full compliance with the eligibility criteria by the second author (HRJ); a few discrepancies were resolved through discussion with a third reviewer (JS). For this process, we used the Covidence online software platform.[15] Pawson recommends appraising the quality of studies using judgment and considering relevance and rigor from a "fitness-for-purpose" perspective (the synthesis itself determines the value of the evidence).[13] Although we included studies with useable data regardless of quality, an understanding of quality is relevant for the ultimate analysis. Thus, the Mixed Methods Appraisal Tool (MMAT) was used by the first two authors to provide an overview of quality in included studies.[16] The details of the MMAT and appraisals for each study are presented in Supporting Information 2 and 3.

2.4 | Extraction and organization of data

A data extraction tool was devised and completed for each paper to describe main study characteristics (eg, year, design, setting, interventions), to identify initial program theories, descriptive contexts (C), mechanisms (M), and outcomes (O) and to develop refined program theories arising from these CMO configurations. Program theories were constructed by the often-used "*if-then"* sentences. For example, "young pregnant women under caseload care may be able to address modifiable risk factors (eg, maternal behaviors, stressors) (C) associated with preterm birth (O) by enhancing antenatal engagement (M)" was converted into the following program theory: "*If* maternity services provide young pregnant women with care that enhances antenatal engagement, *then* they may be able to address promptly modifiable risk factors and reduce the risk for a preterm birth." This process guaranteed transparency by translating findings into more tangible and applied hypotheses. A total of 45 program theories were constructed from the findings of the 11 included studies (see Supporting Information 4). Since data extraction in realist reviews is not linear, an iterative approach was adopted to regularly revise data sections and capture emerging mechanisms.[14]

2.5 | Synthesis of data

In a realist review, the aim of data synthesis is to achieve refinement of program theories—that is, what works, for whom, how, and in what circumstances. We used the NVivo software [17] for organizing and analyzing the program theories drawn from each study to uncover key themes and develop middle-range theories while increasing transparency in decision making.[18] Thus, we grouped the 45 program theories into the most commonly occurring themes and then further defined them into 10 CMO configurations (see Supporting Information 5). This process enabled similar theories to be condensed, theories specific to certain groups of women (eg, women with specific risk factors or demographic attributes) to be extracted, or conflicting theories to be identified. Middle-range theories are helpful to conceptualize complex reality so that explanations of findings become possible and generalizable.[14] This conceptualization can also inform the analysis of ongoing studies evaluating continuity models of care for women at increased risk of PTB.[19]

3 | RESULTS

Search strategies of the electronic databases and additional sources identified a total of 2593 citations, leaving 2489 studies after duplicates were removed. Following title and abstract screening, 74 were selected for full-text assessment of eligibility, and 65 of those were excluded because the intervention or the outcomes did not meet the inclusion criteria. Subsequently, the remaining eleven studies were included in the review (see PRISMA diagram, Figure 1). A summary of key characteristics of included studies is presented in Table 2 and further detailed in Supporting Information 4. Overall, included studies were conducted in a range of settings in the United Kingdom, Australia, and the United States (US); included models of midwifery continuity of antenatal, intrapartum, and postnatal care varied in composition, level of continuity, and *modus operandi*. Women were classified based on various and often overlapping factors such as age (young or adolescents defined as aged 21 years or less), Indigenous status (Aboriginal and Torres Strait Islander peoples—sometimes referred to as Indigenous Australians), obstetric risk (low or mixed risk for pregnancy complications), Medicaid and Children's Health Insurance Program (CHIP) eligibility (United States free or low-cost health coverage to low-income individuals, families, and children, pregnant women, the elderly, and people with disabilities), and social risk (women who live in deprived areas or with complex social risk factors, eg, refugees and asylum seekers, abuse survivors, women with substance use disorder, and young mothers).[20-30]

The key evidence synthesis is shown in Table 3 and presented below in relation to the program theories grouped into the most commonly occurring middle-range theories (woman-midwife partnership, maternity pathways and processes, system resources), and developed into 10 CMO

TABLE 2 Main characteristics of included studies

Study ID	Study type	Place	Year	Participants	Intervention
[20,26]	NRQ and MM	AUS	2008-2011	1971 young and adolescent women	Caseload midwifery: a primary midwife provided AN, IP, and PN care (up to six weeks after birth) in community and hospital settings; and worked as part of a MGP of four midwives who provided back-up support.
[21]	NRQ	AUS	2004-2006; 2009-2011	730 Australian Aboriginal women from all risk profiles	MGP: A primary midwife and partner midwife backed up by a MGP of six midwives provided two different models of care depending on where the woman resided: suburbs (AN, IP, and PN care) vs remote communities (shared care with community health workers and remote outreach midwives). The team included the following: one coordinator, two health workers, one senior Aboriginal woman, one administration officer, and two midwifery holiday relievers.
[22]	NRQ	UK	2012-2013	216 women with complex social factors	Caseload midwifery: a primary midwife provided AN, IP, and PN care for a caseload of 35 women/year and coordinated multiprofessional services; and worked as part of a team of six midwives who provided back-up.
[23]	NRQ	AUS	2013-2017	1024 Australian Indigenous women from all risk profiles	Caseload midwifery: a named and partner midwife (backed up by a team) provided AN, IP, and PN as part of a BIOC service, which also includes Indigenous governance and partnership steering committee; an Indigenous workforce strategy; and an Indigenous community-based hub and integrated family services. Care at home, the hub, or at hospital.
[24]	QD	UK	1997-2017	2568 women at low high risk (many living in deprived areas)	Caseload midwifery model: a primary midwife and a secondary (partner) midwife provided and coordinated AN, IP, and PN up to 28 days after birth at home, community, and the hospital. Midwives collaborated with other professionals as needed.
[25]	QD	AUS	2009-2013	763 Australian Aboriginal and non-Aboriginal women at low risk	Caseload midwifery: A primary midwife coordinated and provided AN, IP, and PN care to a caseload of 40 women/year (backed up by a team of six midwives) and in consultation with other health professionals. If complications arose before or during labor, transfer out of the program was recommended.
[27]	MM	AUS	2004-2005	80 Australian Aboriginal women at low risk	Caseload midwifery: two teams of 3 midwives provided AN, IP, and PN care in two towns (a primary midwife backed up by the other two colleagues)
[28]	RCT	AUS	1996-1998	1000 women at low and high risk	Team midwifery: 7 midwives provided AN, IP, and some PN care (hospital) in consultation with medical staff. Care plans prepared for women at risk of complications.
[29,30]	NRQ and MM	US	2013-2017	6424 Medicaid or CHIP recipients	Birth center care: a team of 2-6 midwives/nurse-midwives (or more depending on site size) provided AN, IP, and PN across AABC sites as part of the Strong Start for Mothers and Newborns Initiative. Birth centers worked with a "peer counsellor," and a network of referral practitioners including AN and PN is provided in the birth center, IP care was provided in the birth center or hospital in collaboration with physicians.

Abbreviations: AABC, American Association of Birth Centers (AABC); AN, antenatal; AUS, Australia; BIOC, Birthing in Our Community; CHIP, Children's Health Insurance Program; IP, intrapartum; MGP, Midwifery Group Practice; N/A, not applicable; NRQ, nonrandomized quantitative; PN, postnatal; QD, quantitative descriptive; RCT, randomized controlled trial; UK, United Kingdom; US, United States.

configurations (personalized and woman-centered care, trust, and empowerment; booking to maternity care, antenatal attendance and care, management of risk factors, referrals and additional support, and postnatal pathways; and organization of health services and education and guidelines).

3.1 | Woman-midwife partnership

The development of a "woman-midwife partnership" was concurrent across most included studies; as such, we included it as a middle-range theory. We found that for any women at low or mixed risk of complications, for those who were young, Indigenous Australians, and United States Medicaid and CHIP recipients, or for those who had social risk factors, building trusting relationships with culturally competent and respectful practitioners, experiencing a sense of calm, support, and self-confidence, and accessing positive, flexible, and individualized care with telephone access 24/7 affected how maternity care was accessed and experienced. For example, sharing of information and concerns, encouragement of open discussions

Control/Comparison	Outcome (PTB < 37 weeks)
Young women's clinic: rostered midwives provided AN care in a community clinic with multidisciplinary involvement. Standard care: shared AN, IP, and PN care mainly by hospital midwives and/or obstetricians; sometimes family physicians/GP.	6% caseload care vs 11% standard care
Pre-MGP baseline care: resident midwives, nurses, doctors, and Aboriginal health workers provided most care in health centers. AN and IP care were mainly provided in the hospital by multiple care practitioners; midwives only provided AN care on a part time and general nursing care at any other times. At discharge, rare PN in community.	21% pre-MGP vs 20% post-MGP
Standard care: not defined.	3% caseload care vs 8% standard.
Standard care: any other services such as shared care with her family doctor (most common); midwife and obstetric antenatal clinics; specialized clinics (eg, diabetes, drug and alcohol dependency; Maternal-Fetal Medicine); and caseload midwifery for under 25 women.	BIOC service vs standard care (OR 0.57, 95% CI 0.37-0.89)
NA	5% caseload care vs 7.5% national average
NA	9% Aboriginal vs 3% non-Aboriginal; 6% MGP
NA	6.3% caseload care
Standard care: care led by hospital obstetric staff; shared care between hospital obstetric staff and community midwives; shared care between hospital obstetric staff and community GPs; or care by hospital midwives and obstetric staff	2.4% team care vs 6% standard care.
Standard care: the usual Medicaid maternity care, which was predominantly provided in the medical model with birth occurring in the hospital, involving relatively high levels of intervention, and attended by physicians.	4.4% AABC vs 9.9% standard care.

and informed choices, willingness to disclose risk factors or harmful behaviors, and planning of early and culturally responsive interventions reduced perceptions of racism and discrimination, and improved experiences of care, safety, and quality, which might reduce distress and anxiety. A trusting relationship between the midwife and the woman might also have influenced women to change their behavior to address modifiable risk factors for PTB, increase compliance with professional advice, and heighten engagement in self-care activities (eg, smoking cessation, healthy diet, exercise).

3.2 | Maternity pathways and processes

Five of the ten CMO configurations were related to maternity pathways and processes for adolescents, United States Medicaid and CHIP recipients, Indigenous Australians, and women with social risk factors. We found that early booking appointments within 10-13 weeks' gestation, and a first personal contact by telephone by a midwife who arranges the first booking visit at a convenient time and place, help to increase the potential for timely initiation of care and identification and management of risk factors for PTB for women receiving

TABLE 3 Program theories grouped into middle-range theories and developed into CMO configurations

Middle-range theory	CMO Configuration	Context	Mechanisms	Outcomes
Midwife-woman partnership	Personalized and woman-centered respectful care	Pregnant women who are young or adolescents; have complex social factors; are Medicaid and CHIP recipients, are Indigenous Australians; or are at low and high risk of pregnancy complications.	• First contact by means of a telephone call by a caseload midwife (rather than an official appointment letter by post) who introduces herself, describes the continuity service, and arranges a home booking visit. • Development of a rapport and with an approachable, sensible, and skilled health care professional. • Access to a positive, individualized, and flexible approach feeling at the center of care and with no need to repeat own story every time. • Access 24/7 with a midwife with whom they were familiar (busing telephone calls and text messages, outside scheduled sessions) for professional services and advice tailored to own needs and emotional/social support. • Promotion of culturally competent and respectful continuity care, free of racism and provided by nonjudgmental sensitive staff.	Increased engagement and reassurance; relationship building; increased perceptions of safe and quality care; reduced perceptions of discrimination or unfairness; increased referrals and service uptake; early and culturally appropriate interventions; greater involvement in health well-being; greater maternal satisfaction, increased control, confidence and support; reduction in distress, anxiety; emotional/social support; reduced ethnic disparities
	Trust		• Development of a trusting relationship with the same person overtime with more opportunities to trust the health system, engage, encourage open discussions, share concerns, disclose, and respectfully influence service and advice uptake (eg, smoking cessation, diet) • Provision of advocacy through known midwives, for example, during attendance at meetings, and other forms of support during interactions with specialists (eg, social care, mental health).	
	Empowerment		• Feelings of being comfortable, building confidence, raising issues with someone known, feeling "special," in control, calm, empowered, supported. • More options to receive health education, discuss, and encourage informed decisions and choices about care practitioner and care model. • Perceptions of a more respectful, natural, and less interventionist/medical philosophy of care where women in control of their pregnancy care.	
Maternity pathways and processes	Booking to maternity care	Pregnant women who are young or adolescents; have complex social factors; are Medicaid and CHIP recipients; or are Indigenous Australians.	• Personal contact by telephone by a midwife who flexibly arranges a first booking home visit at a time and a place that is suitable to both midwife and woman. • Advocacy and support to avoid "falling through the gaps" in the hospital administrative system and early access to maternity care (within 10-13 weeks' gestation). • Timely access to care, routine tests, and referrals in respect of current and current medical, obstetric, surgical, and social history (eg, cervical procedures, mental illnesses, smoking, substance misuse).	Early initiation of care and continuation: early interventions.
	Antenatal attendance and care		• Enhanced antenatal engagement through continuity of caregiver, telephone access to midwives 24/7, and access to more flexible, less stressful clinics with longer visits and less waiting times. • Prompt and regular attendance for antenatal care visits (more than 4-5) in both community and hospital settings with ability to rearrange appointments with ease and without reproach (time access and no structured hours). • Use of informal, relaxed, and welcoming environment and "homely" community venues that "does not feel clinical" and provided by helpful health care practitioner. • Early access and enhanced antenatal care and attendance with known midwives and willingness to disclose risk factors, harmful behaviors, or difficult life circumstances (eg, substance misuse, domestic violence, mental illness). • Access to intensive health education (in areas often not addressed in typical visits) to help to understand the importance of a broad range of issues (eg, PTB prevention, diet, exercise, breastfeeding, family planning).	Service uptake and quality; engagement; care continuation; accessibility and responsiveness; opportunities for relationships, early interventions; reduced complications for mothers and babies; improved birth outcomes.

(Continues)

TABLE 3 (Continued)

Middle-range theory	CMO Configuration	Context	Mechanisms	Outcomes
	Management of complications, referrals, and additional support		• Development of staff guidelines on how to respectfully address behavioral change to address modifiable risk factors (eg, smoking, weight gain) and at the same time keep developing a relationship with woman to help her engage in self-care actives. • Accurate record and follow-up of routine screening tests results (eg, including Hep B, rubella, and HIV) and prevalent preventable complications (eg, sexual transmitted infections) • Early referral pathways for safety and well-being (eg, specialist care, psychiatric services, smoking, domestic violence) and additional services (eg, interpreters, health visitor, children's centers, housing)—confronting theory: delays in test transportation, actioning results, lack of recall systems/ maternity skills. • Awareness and access of social support for coping strategies and strengthening peer and community support (a well-known stress buffer) to address common stressors (eg, unemployment, financial worries, insecure accommodation)—potential conflicting theory: lack of resources in the community to mitigate the complex needs of many women (eg, for mental health or substance use treatment, stable housing, healthy food, personal safety related to intimate partner violence).	Reduction in maternal complications; improved health and well-being: untreated urine infections, prompt interventions; referrals and uptake; untreated urine infections and anemia and unmade referrals for smoking cessation; reduction in stressors.
	Postnatal care pathways	Pregnant women who are Indigenous Australians; and Medicaid and CHIP recipients	• Promotion of integrative models: culturally competent, safe public health/ life course community models, which integrate maternity and family services (eg, parenting support, contraception, child health); birth center models provide enhanced primary maternity care integrated into the overall perinatal care system.	Improved access and care coordination; community support; reduced intergenerational PTB risk.
	Interagency partnerships and collaborations	Pregnant women who are Medicaid and CHIP recipients; and Indigenous Australians.	• Development of innovative partnerships (eg, Indigenous governance, workforce strategy and steering committee; enhanced caseload midwifery care; Indigenous-controlled community-based hub; and integrated family services) • Early and culturally safe continuity of care and a holistic service with high levels of community investment-ownership-activation and leadership across partner organizations. • Cooperative relationships between birth center staff and the medical community to build trust, set up procedures for communications and transfers, and ensure ability to provide safe, quality care if complications arise.	Culturally responsive early interventions; improved safety and health and well-being outcomes for mother and babies.
System resources	Organization of health services	Pregnant women who are young or adolescents; have complex social factors; are Medicaid and CHIP recipients; and are Indigenous Australians.	• Appropriate infrastructure tacking institutional racism and providing funding and support: staff buy-in and support for enhanced services, midwifery team flexibility and autonomy over own work, self-managed time, 24h on call, telephone access, community and home-based care, appropriate space for providing services. • Improved access to enhanced prenatal care by addressing health system barriers to birth centers (eg, mainly challenges stemming from Medicaid policies and state regulations). • Robust community and social support systems to comprehensively address complex needs and high levels of medical and social risk (eg, mental health, transportation, housing, affordable childcare). • Sufficient resources and appropriate organization of services in remote communities during antenatal, labor periods (eg, transport, interpreter services, mobility of women). • Investment in preconception and early pregnancy periods to address future prevalent chronic disease burden (diabetes, hypertension, cardiovascular diseases) with genesis in utero and early life.	Enhanced antenatal care; improved outcomes and barriers to care quality; funding/prioritization of antenatal services; early treatments; improved services; reduction in chronic diseases for intergenerational PTB risk; reduction of ethnic disparities in PTB.
	Training and guidelines		• Regulation of skilled and qualified midwifery staff, and maternity skill training and support for health care practitioners seeing women at initial antenatal visits in remote areas; cultural competency training to non-Indigenous practitioners. • Access, compliance, and fidelity to maternity multidisciplinary guidelines (eg, referrals, clear transfers).	Implementation/fidelity of guidelines; diverse workforce; improved outcomes and quality of care.

Abbreviations: CHIP, Children's Health Insurance Program; PTB, preterm birth.

continuity models. These approaches may help prevent women from "falling through the gaps' in the maternity system.

Regular attendance for antenatal care visits with known practitioners in flexible, informal, and welcoming environments enhanced engagement and perceptions of quality, and encouraged continuation of care. These, in turn, enabled more opportunities for relationship building, information sharing, disclosure, early referrals, and service uptake for maternal safety and well-being (eg, specialist care, psychiatric services), and additional services (eg, translation services, health visitor, children's centers, parenting support). Access to social support for coping strategies or strengthening community/peer support is also a potential mechanism to address common stressors (eg, unemployment, financial worries, insecure accommodation) linked to adverse outcomes including PTB.

We found two potential conflicting program theories related to the management of complications, referrals, and additional support. The first potential conflicting program theory identified that, for Indigenous Australian women in remote communities, delays in tests, transportation, checking, and actioning results, and a lack of maternity skills and unavailability or underuse of recall systems, might have contributed to untreated or inappropriately treated anemias and urinary tract infections in almost half of women (despite improving screening rates). The opportunity to reduce smoking rates was diminished, as smoking cessation services were provided to less than half the women who reported smoking. The second potential conflicting theory identified involved difficulties reported by practitioners in addressing the pressing needs of many United States Medicaid and CHIP women (particularly for mental health or substance use treatment, stable housing, healthy food, and personal safety related to intimate partner violence) because of a lack of resources in their communities to mitigate these needs.

In relation to collaborations within maternity care pathways, we found that PTBs among Indigenous Australians and United States Medicaid and CHIP women could be reduced by as much as half through the development of innovative partnerships and collaborative services (including the broader medical and socioemotional care communities) that provide Indigenous, culturally safe, and high-quality midwifery continuity of care that adopts a life course approach and integrates maternity and family services (eg, parenting support, contraception, child health). Such approaches should also incorporate high levels of community investment-ownership-activation and leadership across partner organizations.

3.3 | System resources

System resources was the overarching theme for the last two CMO configurations: "organization of health services" and "education and guidelines." Organizational infrastructure, funding and addressing institutional racism, and staff buy-in and support for enhanced services and midwifery teams (eg, flexibility and autonomy, self-managed time, team space, telephone access, and community-based and home-based care) were found to improve continuity of care and health engagement. These factors may have facilitated initiation and continuation of care, disclosure, engagement and acceptance of referrals, potentially modifying predictors for PTB and reducing PTBs, and mitigating disparities in PTB outcomes. Addressing health system barriers to birth centers (eg, mainly challenges stemming from United States Medicaid policies and state regulations) were essential to improve access to enhanced prenatal care for Medicaid and CHIP recipients. For remote living Indigenous Australian women, understanding local contexts is critical; insufficient resources and poorly designed health services negatively affect access to a high-quality, midwifery continuity of care models. In remote communities, key areas for improving access to quality care included the prioritization of antenatal care over acute emergencies, and investing in preconception and early pregnancy periods. Subsequently, inadequate transport, limited interpreter services, especially in multilingual communities, and a lack of culturally safe working practices in cross-cultural contexts all increased intergenerational PTB risk by exacerbating chronic disease burden with genesis in uterine and early life. Lastly, we found that regulation of skilled and qualified midwifery staff, provision of education and training (eg, cultural competency sessions, maternity trainings), and better access to and compliance with maternity multidisciplinary guidelines may also help to improve quality of care, to respond promptly to social needs (eg, referral to services or advocacy), and to address preventable factors associated with PTB (eg, sexual transmitted infections, urine infections) that are prevalent in communities with low socioeconomic status and social risk factors.

4 | DISCUSSION

Midwifery continuity of care models are complex interventions, and it is unclear whether the pathway of influence on PTB outcomes is the continuity of care, the midwifery philosophy of care, a combination of these, or another underlying/hidden mechanism.[31] This systematic realist review identified, appraised, and reviewed quantitative and qualitative literature exploring the impact of continuity models on PTB; the aim was to identify the contexts and mechanisms that may contribute to outcomes. These contexts and mechanisms were coded and developed into CMO configurations, providing a group of middle-range theoretical explanations for how this complex intervention may work and for whom.

Aboriginal and Torres Strait Islander Australians made up nearly half of the studies' populations. Although eight studies

found that participants lived in disadvantaged areas or were of low socioeconomic, only one study included social factors in their inclusion criteria. Poor health status, social inequalities, and poor access to health services among the groups most at risk of PTB have been well documented.[32-35] In addition, study participants were more likely to experience poor physical and mental health, social distress, infections and other complications, smoking, PTB, stillbirth, and both maternal and neonatal deaths.[32-35] This health profile emerges from the social and economic disadvantage wrought by structural inequality and institutionalized racism wherein complex contributing factors such as discrimination, unresponsive health institutions, failure to embed woman-centered care, social exclusion, and other factors (eg, genetic predisposition, lifestyle issues) contribute to poor outcomes.[30,32]

The impact of relationships as a pathway for providing safe, high-quality health care is widely recognized.[36-38] Women receiving midwifery continuity of care find services easier to access, experience greater satisfaction with information, advice, choice, and preparation for labor and birth, and are more positive about their overall birth experience. They also describe greater individual agency and a sense of control with less anxiety.[6,39] Advocacy, trust, control, listening, and culturally safe practice are important mechanisms linking relational continuity with improved outcomes and positive experiences of care.[40] Because maternal anxiety and stress are associated with spontaneous PTB,[41] and women in continuity models feel safer and more relaxed, it is possible that these models act as moderators on the effects of women's stress, thereby reducing the subsequent risk of PTB. This is evidenced in the Queensland Flood Study (Australia), which reported that midwifery continuity of care mitigated the effects of high levels of stress experienced by women in the context of a natural disaster (flood); however, the processes linking stress and PTB reduction were not explored.[42]

The possible effect of relationships on behavioral change to address modifiable causes of PTB ongoing requires attention. Health-related behaviors are complex, and it is possible that midwives motivate women, building confidence and maintaining encouragement for change over time. Research has already shown how support through continuity of care with a primary care practitioner may mediate changes in patients' behavior,[43] though midwifery approaches need further evaluation.[44] An untested, conflicting program theory emerging from the literature on experiences of standard maternity care among women with social risk factors argued that having rapport with the same health care professional may sometimes be perceived as surveillance. In this way, relationship building may feel like an invasion of privacy; rather than being perceived as safe, understanding, and kind, one trusted professional embedded in a wider, toxic environment may not promote trust nor behavioral change.[45] When this program theory is tested, it will be interesting to examine the impact of continuity of care on feelings of surveillance as a trusting relationship develops.

Early booking to antenatal care during the first 3 months of gestation is essential as it appears to play a major role in prevention, early detection, management, and treatment of complications, and a minimum of eight antenatal contacts is now recommended as a method for reducing perinatal mortality and improving women's experience of care.[46] Also, early access and engagement to social, community, and peer support (a potential stress buffer) could be a mechanism to address common stressors, which are associated with PTB.[47,48] Although the barriers to care for women living socially complex lives and challenges for practitioners were identified, robust community and social support systems, and provision of culturally competent care are essential to comprehensively address complex needs and high levels of clinical and social risk, while also improving experiences and quality care for these women.[29,49] Our findings closely align with the findings of a Cochrane review on provision and uptake of routine antenatal services, which found that initial and continued use of antenatal care depends on a perception that doing so will be a positive experience. For health care professionals, the capacity to deliver high-quality, relationship-based, and accessible antenatal care depends on sufficient resources, staffing, and organizational norms and values that are clearly kind, effective, respectful, and culturally appropriate.[50] The impact of systematic racism and discrimination on birthing outcomes of diverse groups still needs to be quantified and qualified by robust research, especially when wanting to understand how continuity models may act as a buffer or protective factor for preventing PTB.[29,51]

Strong interagency partnerships and collaborations across different partners and sectors (eg, health and social care, local governments) also play a vital role in improving outcomes for pregnant women and babies.[52] Innovative systems that provide integrated, community services with strong clinical governance frameworks, and establish collaborative arrangements by cultivating stakeholder buy-in, show promise for reducing PTBs among Indigenous Australian women and United States Medicaid and CHIP recipients. People-centered and place-based models of care are currently recommended for successful health care integration as these can shift the way health services are funded, managed, and delivered "*from health systems designed around diseases, health institutions and workforce models towards health systems designed for people*".[53] In the United Kingdom, local maternity systems are being created to implement change at a local level and to ensure that women, babies, and families can access the services they need and choose, in the community, as close to home as possible.[54] Community-based continuity models of care may reduce stress and anxiety through familiar, less-medicalized environments that are easier to access, and enhance the strengths of community and peer support.

This study has several limitations. The quality of evidence varied among studies, though overall and from a realist perspective, it was generally high with all included studies reporting the impact of midwifery continuity of care models on PTB. In addition, only studies from high-income countries were identified. A recent review of midwife-led care in low-income and middle-income countries found twelve studies describing midwifery continuity of care, though none of them reported PTB outcomes, nor potential mechanisms.[55] Some of the studies included in this review were highly contextualized (in particular, remote communities in Australia and Medicaid recipients in the United States). However, young women (aged less than 20) and Indigenous Australians, and women and families living with social and economic disadvantage in the United States and the United Kingdom, often share some experiences, including adverse health outcome. In-depth understanding of what are the socially complex issues that might be compounding on the women's health and how is the care making a difference is crucial. It is possible that other mechanisms falling outside the scope of this review, or those not directly related to either context or the outcome of interest, may affect PTB, such as antenatal group education or differences in risk profiles, spontaneous or iatrogenic PTBs, or the transgenerational impact of colonization and discrimination.[32] Further research should examine the physiological impact of distress, racism, and discrimination on stress levels (and thus PTB) and the impact of place-based models, care coordination, and navigation of health services.

5 | CONCLUSIONS

This realist review has drawn on global literature to provide an underlying theory on how, why, and under what circumstances midwifery continuity of care models may influence PTB outcomes. We found that pregnant women living in different contexts in the United Kingdom, Australia, and the United States at low and mixed risk of complications and with low socioeconomic status and/or social risk factors can experience continuity models in similar ways. Similar underlying mechanisms such as trusting relationships, advocacy, respectful and culturally safe care, access to support services, and community networks may influence PTB outcomes. Going forward, these CMO configurations will be used as conceptual frameworks for exploring potential mechanisms during the implementation of midwifery continuity of care models for women at risk of PTB and living in socially deprived areas of London (UK). This synthesis also highlights important gaps in the literature that require further research, such as a better understanding of how midwifery continuity of care models may be contributing to improved PTB outcomes for different population groups through the possible pathways of maternal behavioral change, physiological stress-level reduction, care coordination, and supports for health service navigation.

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CONFLICT OF INTEREST

None of the authors have competing interests.

AUTHORS CONTRIBUTIONS

CFT, HRJ, and JS designed the study. CFT, HRJ, and JS selected studies for inclusion. CFT and HRJ extracted data and assessed quality. CFT, HRJ, YR, and JS contributed to the analyses and interpretation of the findings. CFT drafted the manuscript. HRJ, YR, SAS, KC, AHS, and JS commented and approved the final version of this report.

DATA AVAILABILITY STATEMENT

Data sharing not applicable to this article.

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SUPPORTING INFORMATION

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

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