



Implementing midwifery twinning partnerships: challenges and facilitators. A rapid evidence summary

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Abstract:

Twinning is a partnership method that focuses on mutual transfer of knowledge and skills between two parties, including organisations, clinical practices, universities, or individual health professionals. In midwifery, twinning is a particularly important tool that can help countries with high maternal and infant morbidity and mortality rates to make connections with countries where sickness and death rates related to birth are lower and the role of midwives is better developed. The aim of this rapid evidence summary is to explore the literature for midwifery twinning initiatives and the facilitators and challenges of twinning partnerships.

Sixteen research reports and textual evidence were identified.

Facilitators of successful implementation of twinning initiatives include having a clear vision and mission statement along with investing time and promoting a co-creational approach. Reciprocity along with the building of personal relationships. Strong leadership, commitment, values, mutual respect and personal rapport between the projects. Clear communication plans, workshops, peer exchange visits alongside regular virtual contact. Building on existing relationships, previous experience of international and cross-cultural work and being prepared to overcome cultural differences. Having a local project team and careful; matching and selection of twins and having an adaptable personality. Having funding available.

Challenges include communication issues, cultural differences in communication, technological issues and economic considerations. Additionally misplaced expectations, such as difference in social expectations, or one twin partner expecting opportunities that are not agreed upon by the other poses challenges to the successful implementation of twinning initiatives

Wales Centre For Evidenced Based Care (WCEBC) Rapid Evidence Summary

Implementing midwifery twinning partnerships: challenges and facilitators

EXECUTIVE SUMMARY

What is a Rapid Evidence Summary?

This Rapid Evidence Summary (RES) is designed to provide an interim evidence briefing to inform further work and provide early access to key findings. It is based on a limited search of key resources and no quality appraisal or evidence synthesis was conducted, and the summary should be interpreted with caution.

Who is this summary for?

World Health Organisation Collaborating Centre for Midwifery Development, Cardiff University, Wales, UK .

Background / Aim of Rapid Evidence Summary

Twinning is a partnership method that focuses on mutual transfer of knowledge and skills between two parties, including organisations, clinical practices, universities, or individual health professionals. In midwifery, twinning is a particularly important tool that can help countries with high maternal and infant morbidity and mortality rates to make connections with countries where sickness and death rates related to birth are lower and the role of midwives is better developed. The aim of this rapid evidence summary is to explore the literature for midwifery twinning initiatives and the facilitators and challenges of twinning partnerships.

Key Findings

Sixteen research reports and textual evidence were identified.

Extent of the evidence base

- Types of included reports included descriptions of twinning initiatives with (n=2) or without a case study (n=7), a Delphi study (n=1), qualitative studies (n=2), mixed methods studies (n=2), a systematic review (n=1) and a literature review (n=1)
- Twinning partnerships focused on relationships between the following high income and low and middle income countries (North-South partnerships)
 - The Netherlands - Sierra Leone (n=3) or Morocco (n=2);
 - United Kingdom – Cambodia (n=1), Nepal (n=2), Rwanda (n=1), or Uganda (n=5);
 - Canada – Tanzania (n=2);
 - Japan – Mongolia (n=1);
 - Switzerland – Mali (n=1);
 - Australia – Papua New Guinea (n=1)

Recency of the evidence base

- The rapid evidence summary included evidence available up until January 2023, with reports published between 2013 and 2022.

Facilitators

- Reciprocity along with the building of personal relationships.
- Having a clear vision and mission statement along with investing time and promoting a co-creational approach.
- Strong leadership, commitment, values, mutual respect and personal rapport between the projects.
- Clear communication plans, workshops, peer exchange visits alongside regular virtual contact
- Building on existing relationships, previous experience of international and cross-cultural work and being prepared to overcome cultural differences.
- Local project team
- Careful; matching and selection of twins and having an adaptable personality.
- Funding

Challenges

- Communication issues between different training institutions, employers, and stakeholders.
- Cultural differences in communication, the meaning of a twin, and the lack of preparedness to bridge differences in culture.
Technological issues, such as limited access to reliable internet, connectivity issues, different IT systems, and the lack of opportunities for in-person meeting.
- Monitoring and evaluating twinning initiatives can be problematic due to cultural differences in gathering data and the absence of indicators on what is considered success in a twinning partnership.
- Economic considerations, such as insufficient funding for travel or having a coordinator can be a barrier.
Misplaced expectations, such as difference in social expectations, or one twin partner expecting opportunities that are not agreed upon by the other.
- Human resource issues including staff turnover or shortages, or overburdening twinning participants.

Next steps

- To conduct a systematic review focusing on the barriers and facilitators of twinning initiatives that could be broadened to include other healthcare professionals, such as nurses. The planned review could help inform the development of future twinning partnerships.

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Abbreviations:

| Acronym | Full Description |
|---------|---------------------------------|
| HIC | High income countries |
| LMIC | Low and middle income countries |
| SDGs | Sustainable Development Goals |

1. CONTEXT / BACKGROUND

The United Nations adopted Sustainable Development Goals (SDGs) to help eradicate poverty while sustaining peace and freedom across the globe (United Nations 2015). The SDGs focus on 17 areas, which include ending poverty and hunger; achieving good health and well-being, quality education, clean water and sanitation, affordable and clean energy, decent work and economic growth for all, responsible consumption and production, peace and justice; ensuring gender equality and reducing inequalities; improving industry, innovation, and infrastructure; making cities sustainable; taking action on climate change; and preserving life in the water and on land (United Nations 2015). Finally, for these goals to become reality, global partnerships are required (United Nations 2015).

For healthcare professionals, achieving the goals of good health and wellbeing and gender equality are particularly important (Cadee 2020). As differences exist between healthcare systems and care provision around the world, collaboration between different countries could help support achieving these goals, while fulfilling the need for global partnership. Twinning is a partnership method that focuses on mutual transfer of knowledge and skills between two parties, including organisations, clinical practices, universities, or individual health professionals (Moyo and Bokosi 2014). In midwifery, twinning is a particularly important tool, as it can help countries with high morbidity and mortality rates among expectant mothers and infants to make connections with countries where sickness and death rates related to birth are lower and the role of midwives is better developed (Moyo and Bokosi 2014). Twinning can contain many activities, including on-site training, study tours, collaboration on technical initiatives, and training, information and technical exchanges (Moyo and Bokosi 2014). The benefits of twinning can be wide ranging, from capacity building to the exchange of best practices and networking, resulting in mutual gains for both parties involved (Moyo and Bokosi 2014). However, challenges to building a successful twinning partnership can also exist, including cultural differences and economic divide among others (Moyo and Bokosi 2014). For a twinning initiative to be successful, there is a need for high quality research to determine its effectiveness and the barriers and facilitators to its implementation and uptake (Cadee 2020). Therefore, the aim of this rapid evidence summary is to explore the literature for midwifery twinning initiatives and the barriers and facilitators of twinning partnerships.

2. RESEARCH QUESTION(S)

| | |
|-----------------------------------------------------------------------------------------|---------------------------------|
| Review question | |
| What are the barriers and facilitators when implementing midwifery twinning initiatives | |
| Participants | Midwives and midwifery students |
| Concept | Twinning partnerships |
| Context | North-South partnerships* |
| Other Study Considerations | |
| English language publications, preprints and organisational reports | |
| Date restrictions – None | |

*North-South partnerships: Partnerships between midwifery organisations and midwives in LMIC and HIC

3. SUMMARY OF THE EVIDENCE BASE

3.1. Type and amount of evidence available

Sixteen research reports and textual evidence were included: seven descriptions of twinning initiatives (Adhikari and Nsubuga 2017; Cadee et al. 2013; Kemp et al. 2018a, Kemp et al. 2018b; Kemp et al. 2018c; Royal College of Midwives 2015; Sandwell et al. 2018); two descriptions of twinning initiative and case studies of midwives' experiences (Ireland et al. 2015; Moyo and Bokosi 2014); one Delphi study (Cadee et al. 2018); two qualitative studies (Cadee et al. 2021a, Cadee et al. 2021b); two mixed method studies (Taniguchi et al. 2022; Voluntary Services Overseas 2022); one systematic review (Dawson et al. 2014); and one literature review (Cadee et al. 2016).

- An evaluation of the Twin2Twin method which seeks to enhance the platform of exchange at an organisational level with the introduction of a personal exchange between individual midwives. This project involved the mutual exchange of knowledge and skills for midwives in Sierra Leone and the Netherlands (Cadee et al. 2013).
- A concept analysis of twinning in healthcare and the development of an operational definition of twinning from the international literature (Cadee et al. 2016).
- A Delphi study with 56 midwives from 19 countries to gain consensus for critical success factors associated with twinning in midwifery (Cadee et al. 2018).
- A qualitative study that explored the contribution of one-to-one relationships between twins to twinning projects, in Morocco and the Netherlands and Sierra Leone and the Netherlands (Cadee et al. 2021a).
- A qualitative study that explored how the professional growth of midwives can be enhanced through twinning collaborations for midwives in Morocco, Sierra Leone and the Netherlands (Cadee et al. 2021b).
- A systematic review that explored the collaborative approaches undertaken to build midwifery education regulation and professional association in low-income countries (partnerships between midwifery organisations and midwives in low and middle income countries (LMIC) described as South–South partnerships or between LMIC and high income countries described as North–South partnerships) (Dawson et al. 2014).
- Two papers that cover different aspects of the Global Midwifery Twinning Project which was a three-year multi-country partnership running from 2012 to 2015 to strengthen health systems through health service skills transfer and capacity development between the UK and three partner organisations (Cambodia, Nepal and Uganda).
 - A paper that describes the importance of collaboration between established national midwifery organisations and newly established ones as part of the Global Midwifery Twinning Project and highlights the experience of a UK midwifery volunteer in Nepal (Ireland et al. 2015).
 - The final evaluation report for the project (Royal College of Midwives 2015).
- Four papers that cover different aspects of the MOMENTUM project which is a twinning initiative between UK and Uganda.
 - A paper that describes the development of a national standard for midwifery mentorship in Uganda and explores twinning partnerships as part of this (Kemp et al. 2018a).

- A paper that describes the development of the MOMENTUM initiative, a 20-month midwifery twinning project aiming to develop a model of mentorship for Ugandan midwifery students (Kemp et al. 2018b).
- A paper describing a practice development workstream, a twinning project that used work-based learning and appreciative inquiry, embedded in an action research approach, to facilitate practice (Kemp et al. 2018c).
- The final project evaluation report (Adhikari and Nsubuga 2017)
- A mixed methods study that evaluated the outcomes of the organisational strengthening of the Mongolian Midwives Association through the twinning project with Japanese Midwives Association (Taniguchi et al. 2022).
- A report of a mixed method evaluation that assesses the impact of the twinning partnership between Nyagatare District Hospital (NDH) in Rwanda and Lewisham Sexual Health Services (LSHS) within Lewisham and Greenwich NHS Trust (LGT) in the UK (Voluntary Services Overseas 2022).
- A paper that describes a successful twinning relationship between midwifery association in Canada and Tanzania, to analyse how and why it worked, and what benefits it provided (Sandwell et al. 2018).
- The operational manual of the International Confederation of Midwives on twinning as a tool for strengthening midwives associations (Moyo and Bokosi 2014).
- Specific twinning initiatives were reported between the following LMICS and HICs:
 - Sierra Leone and the Netherlands (Cadee et al. 2013; Cadee et al. 2021a; Moyo and Bokosi 2014)
 - Morocco and the Netherlands (Cadee et al. 2021a; Cadee et al. 2021b)
 - Nepal and the UK (Ireland et al. 2015; Royal College of Midwives 2015)
 - Uganda and UK (Adhikari and Nsubuga 2017; Kemp et al. 2018a, Kemp et al. 2018b; Kemp et al. 2018c; Royal College of Midwives 2015)
 - Rwanda and UK (Voluntary Services Overseas 2022)
 - Cambodia and UK (Royal College of Midwives 2015)
 - Tanzania and Canada (Moyo and Bokosi 2014; Sandwell et al. 2018)
 - Mongolia and Japan (Taniguchi et al. 2022)
 - Mali and Switzerland (Moyo and Bokosi 2014)
 - Papua New Guinea and Australia (Moyo and Bokosi 2014)

3.2. Key Findings

3.2.1. Positive outcomes of twinning initiatives

- The systematic review conducted by Dawson et al. 2014 was unable to locate an example of twinning in international midwifery contexts (North to South).
- MOMENTUM - a 20 month midwifery twinning project aiming to develop a model of mentorship for Ugandan midwifery students was successful at improving midwifery students in knowledge, skills, attitude and self-reported levels of confidence and competence to provide quality midwifery care (Kemp et al. 2018b).
- The concept analysis of the literature resulted in four main attributes of twinning in healthcare. Most important was reciprocity along with the building of personal relationships, being a dynamic process and that twinning is between two named organisations across different cultures (Cadee et al. 2016).

- The definition that was developed from this was that *'Twinning is a cross-cultural, reciprocal process where two groups of people work together to achieve joint goals'*. (Cadee et al. 2016, p. 8.)
- Positive outcomes were demonstrated as a result of the twinning project between the Japanese Midwives Association and Mongolian Midwives Association (MMA) when organisational strengthening was evaluated through the Member Association Capacity Assessment Tool. Positive opinions and impressions of the twinning project were also elicited through qualitative interviews (Taniguchi et al.2022).
- The Global Midwifery Twinning Project (Royal College of Midwives 2015) had beneficial effects on midwifery practice, education and regulation in the three partner countries (Cambodia, Nepal and Uganda).

3.2.2. Facilitators of successful implementation of twinning initiatives

- Investing time at the beginning of the partnership to develop relationships (Voluntary Services Overseas, 2022).
- Promoting a co-creational approach, where the twin institutions co-design the scoping and work planning phases of the project (Voluntary Services Overseas, 2022).
- Conducting a thorough risk assessment at the start to mitigate the risks associated with staff turnover (Voluntary Services Overseas 2022).
- Establishing a twinning partnership that builds on existing relationships (Voluntary Services Overseas, 2022).
- Strong leadership, commitment, mutual respect and personal rapport between the project leads in each twin institution (Sandwell et al. 2018; Voluntary Services Overseas, 2022).
- Regular virtual contact between visits (Kemp et al. 2018a).
- Clear and agreed communication plans (Cadee et al. 2018; Kemp et al. 2018a).
- Commitment and values (Cadee et al. 2018).
- Making equity explicit in twinning may contribute towards the agency of midwives to take on their identified key role in sexual and reproductive healthcare (Cadee et al. 2018).
- Building trusting relationships (Cadee et al. 2021a).
- Being prepared to overcome cultural differences (Cadee et al. 2021b).
- The development of common midwifery goals (Cadee et al. 2021b).
- Having an adaptable personality (Cadee et al. 2021b).
- A successful twinning partnership is a reciprocal and equitable environment (Cadee et al. 2021b; Voluntary Services Overseas 2022).
- Formation of a social media network via Whatsapp (Kemp et al. 2018a).
- Careful matching and selection of twins (Kemp et al. 2018a).
- A local project team who can make frequent visits to project sites and act as trouble shooters when problems arise (Kemp et al. 2018a).
- Workshops where all participants can reflect, observe and plan (Kemp et al. 2018a).
- Peer exchange visits (Kemp et al. 2018a).
- Repeated placements of short term international health volunteers within the context of a long term partnership (Kemp et al. 2018a).

- Having a clear vision and mission statements (Sandwell et al. 2018).
- Being familiar with international midwifery (Sandwell et al. 2018).
- International global health climate and trends in donor priorities (Sandwell et al. 2018).
- Previous experience with international and cross-cultural work (Sandwell et al. 2018).
- Model of care which emphasises partnership throughout midwives work (Sandwell et al. 2018).
- Funding, both for the initial twinning relationship and for the shared project (Sandwell et al. 2018)

3.2.3. Barriers to successful implementation of twinning initiatives

- Communication issues (Adhikari and Nsubuga 2017; Adhikari and Nsubuga 2017; Voluntary Services Overseas 2022).
 - For example between different nurse /midwife training institutions and workforce employing institutions, between stakeholders (Adhikari and Nsubuga 2017; Adhikari and Nsubuga 2017).
- Cultural differences (Cadee et al. 2013; 2021a, Ireland et al. 2015; Kemp et al. 2018a; Moyo and Bokosi 2014)
 - In communication (Cadee et al. 2013; Kemp et al, 2018a).
 - What it means to be a twin (Cadee et al.2021a).
 - Midwives were unprepared to bridge cultural differences (Cadee et al.2021b).
- Technological issues (Adhikari and Nsubuga 2017; Cadee et al. 2013; Kemp et al. 2018a, Moyo and Bokosi 2014; Sandwell et al. 2018; Voluntary Services Overseas 2022).
 - Limited access to reliable internet, telecommunication connectivity, electric power grid and poor computer skills (Cadee et al. 2013; Kemp et al. 2018a, Moyo and Bokosi 2014). Sandwell et al. 2018).
 - Maintaining the partnership was more difficult when in-person meetings were not possible (Sandwell et al. 2018).
 - Connectivity issues particularly through online communication channels such as Microsoft Teams or Zoom (Whatsapp is easier) Voluntary Services Overseas 2022).
 - Different, uncoordinated IT systems across UK hospitals (Voluntary Services Overseas 2022).
- Time zones especially to organise planned meetings (Kemp et al. 2018a Sandwell et al. 2018).
- The role and position of women in society (Ireland et al. 2015).
- Personality and character differences between individual midwife twin pairs (Cadee et al. 2013; Cadee et al.2021a; Sandwell et al. 2018).
- Issues around coordination and facilitation such as attitudes, professionalism and clarity about process and expectations (Cadee et al. 2013).
- Midwifery is not recognised as a separate profession (Ireland et al. 2015).
- Busy schedules and limited time and energy and workload issues alongside competing responsibilities (Ireland et al. 2015; Kemp et al. 2018; Sandwell et al. 2018).
- Monitoring and evaluation concerns (Cadee et al. 2013; Voluntary Services Overseas 2022).

- Formal evaluation is challenging due to cultural differences in gathering information (storytelling as opposed to written evaluations) (Cadee et al. 2013).
- Insufficient focus on monitoring and evaluation and specifically the absence of indicators to determine what constitutes 'success' for the twinning project
- Economic considerations
 - Midwives being able to fund themselves to travel and carryout activities (Moyo and Bokosi 2014)
 - Lacking the funding for a coordinator to organise meetings between practicing midwives in both countries who were too busy to self-coordinate (Sandwell et al. 2018).
- Misplaced expectations (Adhikari and Nsubuga 2017; Moyo and Bokosi 2014).
 - Minds and social expectations (Moyo and Bokosi 2014).
 - For example, one of the twinning partners may expect the Twinning relationship to provide travel opportunities, while the other may see it as an opportunity to gain exposure through practicing in their Twinning partner's country (Moyo and Bokosi 2014).
- Difficulty in operationalising the equal footing concept due to availability or lack of resources especially when one of the twin countries is an ex-colony (due to historical issues and perceptions) (Moyo and Bokosi 2014).
- Culture of giving and dependency (donor and recipient cultures) - the issue of one twin partner looking to its twin to continually give due to a culture of dependency (Moyo and Bokosi 2014).
- Difficulty in initiating the relationship effectively – not dealing with identified challenges in the set -up phase (Moyo and Bokosi 2014).
- Human resource issues (Adhikari and Nsubuga 2017; Voluntary Services Overseas 2022)
 - Staff turnover (Voluntary Services Overseas 2022)
 - Lack of human resources and shortage of staff (Voluntary Services Overseas 2022).
 - Overburden of human resources – seen as an additional task for midwives to give support to midwifery students (Adhikari and Nsubuga 2017).
- Sustainability (Adhikari and Nsubuga 2017; Voluntary Services Overseas 2022)
- Future uncertainty and anxiety (Adhikari and Nsubuga 2017).
- Reliance on VSO funding and support - - to date, the twinning project has been heavily reliant on VSO funding, brokering and support; while this is expected in the short term, it is clearly not sustainable longer term (Voluntary Services Overseas 2022).

3.3. Areas of uncertainty

- The majority of included reports were descriptions of twinning initiatives indicating a lack of research in the field, particularly quantitative research.
- There is inconsistency in the use of the term twinning in the wider literature (Cadee et al. 2016), with twinning often classified as international collaboration or exchange. Thus, it is possible that more literature on twinning is available.
- There is a lack of clarity in how the process of twinning and its related contributions to midwifery and maternal health improvements are assessed, particularly in capacity

building projects (Dawson et al. 2014). This could influence the methodological quality of studies, and the certainty in research findings and the available evidence.

4. NEXT STEPS

- A qualitative or mixed methods (including textual evidence) systematic review focusing on the barriers and facilitators of twinning initiatives that could be broadened to include other healthcare professionals, such as nurses.

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6. RAPID EVIDENCE SUMMARY METHODS

Five databases were searched (Cinahl, Embase, Global Health, Medline Ovid Emcare in December 2022 and the search strategies are provided in Appendix I. Search hits were screened for relevance by two reviewers. No formal quality assessment was conducted. Citation, recency, evidence type and key findings were tabulated for all relevant primary and secondary research identified in this process by one reviewer and checked for accuracy by a second.

7. EVIDENCE

Table 1. Summary of review evidence identified

| Evidence type | Total identified | Comments |
|---------------------------------------------------|-------------------------|----------------------------------------------------|
| Description of twinning initiative | 7 | |
| Description of twinning initiative and case study | 2 | |
| Primary Studies | 5 | 1 Delphi study 2 Qualitative 2 Mixed methods |
| Literature review | 1 | |
| Systematic reviews (SRs) | 1 | |

A more detailed summary of included evidence can be found in Table 2.

Table 2: Summary of included evidence

| Resource | Citation | Focus Twinning details | Key Findings |
|-------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Description of twinning initiative | | | |
| Contacting author of Momentum project | Adhikari and Nsubuga 2017 Model of mentorship for Ugandan midwifery. End of project evaluation report | <u>Focus</u> To describe the final evaluation of the MOMENTUM (Model of Mentorship for Ugandan Midwives) <u>Twinned countries / regions</u> Uganda and the UK MOMENTUM initiative | Challenges Adhikari and Nsubuga 2017 Communication issues – between different nurse /midwife training institutions and workforce employing institutions, between MOMENTUM stakeholders, technological issues, mismatch of expectations Overburden of human resources – seen as an additional task for midwives to give support to midwifery students Sustainability – future uncertainty and anxiety |
| Database search | Cadee et al. 2013 'Twin2twin' an innovative method of empowering midwives to strengthen their professional midwifery organisations https://dx.doi.org/10.1016/j.midw.2013.07.002 | <u>Focus</u> The aim of this project was to strengthen the midwifery organisations of Sierra Leone and the Netherlands <u>Twinned countries / regions</u> Sierra Leone and the Netherlands <u>Key features</u> Twin2twin method – Enhancing the platform of exchange at an organisational level with the introduction of a personal exchange between individual midwives. Involved the mutual exchange of knowledge and skills | Cultural differences in communication - Limited access to the internet and computer skills in Sierra Leone to enable video exchange (communication via text messaging and hand written letters) - Communication management and cultural understanding, such as differences in style of written communication -Face to face meetings brought a greater degree of understanding - With subtle differences such as intonation or the use of humour there was a great will to want to learn, but certain blatant differences were more difficult to bridge. For example KNOV midwives tended to speak out when there was a difference in opinion where as SLMA midwives tended to become silent. - Expectation management can play an important role in tackling this issue, but even expectation management is a cultural concept Having a twin - Personality and character differences were thought to influence the success of the project. - For example a few of the twin matches did not work because of the difference between them either in age, status, language, life philosophy etc Coordination and facilitation Issues that were highlighted included communication, availability, attitudes, professionalism and clarity about process and expectations |

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| | | | <p>Evaluating outcomes</p> <p>It was found that evaluating the project by means of written evaluations and focus group discussions was a challenge due to cultural differences (storytelling versus written evaluation)</p> |
| Database search | <p>Kemp et al. 2018a</p> <p>Developing a national standard for midwifery mentorship in Uganda</p> <p>https://dx.doi.org/10.1108/JJHG-09-2017-0051</p> | <p><u>Focus</u></p> <p>To describe the development of a national standard for midwifery mentorship in Uganda, part of a wider project which aimed to develop a model of mentorship for Ugandan midwifery students using the principles of action research</p> <p>To stimulate debate about strengthening the capacity of a health regulatory body, midwifery twinning partnerships and the use of international health volunteer placements</p> <p><u>Twinning countries / regions</u> Uganda and the UK MOMENTUM initiative</p> | <p>Midwifery twinning can be a successful strategy for effective organisational and leadership development and mutual change.</p> <p>Barriers to twinning relationships</p> <p>Communication posed a significant challenge to the twinning relationship.</p> <ul style="list-style-type: none"> - Limited communication time due to workload - Different cultures, time zones and unreliable internet connectivity required clear communication strategies, flexibility and persistence -Formation of a social media network via Whatsapp was enormously helpful for the project as a whole, though this did not work where communication by e-mail was preferred <p>Recommendations</p> <ul style="list-style-type: none"> -Twins must be carefully selected and matched and clear plans agreed for communication with strategies, such as frequent visits to project sites, or formation of social media network (e.g. Whatsapp) -Repeated placements of short-term international health volunteers within the context of a long-term partnership, with supportive supervision in both home and host countries and with regular virtual contact between placements -Peer exchange visits were pivotal to success and must be built into project funding -Further research into the reciprocal impact of health volunteering on individuals, their home organisations and the wider health services is needed |
| Database search | <p>Kemp et al. 2018b</p> <p>Developing a model of midwifery mentorship for Uganda: The MOMENTUM project 2015-2017</p> <p>https://dx.doi.org/10.1016/j.midw.2018.01.013</p> | <p><u>Focus</u></p> <p>MOMENTUM was a 20 month midwifery twinning project aiming to develop a model of mentorship for Ugandan midwifery students</p> <p><u>Twinning countries / regions</u> Uganda and the UK MOMENTUM initiative</p> | <p>Twinning provided a platform for system change and for reciprocal learning across multiple organisations</p> <p>MOMENTUM project represents an entire system re-design based on 3 years of relationship building, needs assessment, and a continual process of stakeholder engagement; without these critical elements, any attempts to build a model of midwifery mentorship may not succeed</p> <p>When measured at the mid and end-points evaluations participating mentors and midwifery students demonstrated significant improvements in knowledge, skills and attitudes</p> <p>Additional qualitative data showed that participants perceived being involved in</p> |

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| | | | mentorship had improved their confidence and competence to provide quality midwifery care |
| Database search | <p>Kemp et al. 2018c</p> <p>Improving student midwives' practice learning in Uganda through action research: the MOMENTUM project</p> <p>https://dx.doi.org/10.19043/ipdj81.007</p> | <p><u>Focus</u></p> <p>To describe a practice development workstream, a twinning project that used work-based learning and appreciative inquiry, embedded in an action research approach, to facilitate practice development</p> <p><u>Twinned countries / regions</u></p> <p>Uganda and the UK MOMENTUM initiative</p> | <p>Twinning, action research, appreciative enquiry and work-based learning can be effective in enabling practice development</p> <p>Potential barriers</p> <ul style="list-style-type: none"> -The under-resourced health system, staff redeployments and absences posed challenges, as did bureaucracy, hidden hierarchies and protocols - Student throughput in practice areas was inconsistent -Cultural challenges included different expectations of twinning, the place of religion in society, sensitivity regarding appropriate clothing and different interpretations of what it meant to be a student or to be a professional -Communication difficulties resulting from problems with power supply and internet connection, differences in time and expectations, and smartphone availability/ familiarity - Action research and work-based learning were new concepts to most of the project's participants and management team. While challenging, this also provided opportunities for learning -The replicability of this model depends on the funding and capacity to manage such a labour-intensive project; this project was externally funded and had two management teams <p>Potential facilitators</p> <ul style="list-style-type: none"> -Project managers and stakeholders proved invaluable for complex negotiations -Twinning enhanced cultural competence in UK and Ugandan counterparts. Demonstration of cultural competence was required of UK midwives at selection but not of their Ugandan twins. While cultural competence training has been found to be effective, it is only by being in place in country during the project that volunteers were truly able to begin to develop their cultural competence in working with Ugandan midwives. -Action research through twinning facilitated deep learning - Sufficient lead time to develop the monitoring and evaluation framework, to ensure planning and set-up is entirely participatory, and to pilot and adapt tools before baseline measurements <p>Recommendations</p> <ul style="list-style-type: none"> -The impact of midwifery twinning on leadership development requires further investigation, together with greater evidence on the reciprocal impact of twinning on the sending country |

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| <p>Google search</p> | <p>Royal College of Midwives 2015 Global Midwifery Twinning Project https://www.rcm.org.uk/media/2389/supporting-midwifery-beyond-our-borders.pdf</p> | <p><u>Focus</u> The Global Midwifery Twinning Project was a three-year multi-country partnership running from 2012 to 2015 to strengthen health systems through health service skills transfer and capacity development</p> <p><u>Twinned countries / regions</u> UK and Cambodia, Nepal, Uganda</p> <p>Audit of mentoring practice</p> <p>Provision of mentors for student midwives</p> | <p>What was achieved?</p> <ul style="list-style-type: none"> -The programme had beneficial effects on midwifery practice, education and regulation in the three partner countries -It strengthened the capacity of the three overseas partner midwifery associations, and increased their commitment to improving maternity and newborn care -It created strong twinning relationships and enabled networking and sisterhood between midwives in the four countries -It raised awareness of midwifery issues in low-income countries and the importance of international engagement among volunteer midwives, their employers, RCM staff and members, policy makers and other stakeholders in the four UK countries -It gave many volunteers greater confidence in their own skills and knowledge, and renewed their commitment to midwifery in the UK <p>What was learnt?</p> <ul style="list-style-type: none"> -The RCM's delivery of this ambitious, challenging project after a difficult start, demonstrated its adaptability, flexibility and capacity to change. -That future programme designs will take a realistic view of what can be achieved, have precise goals and objectives underpinned by clear values, with defined ground rules and specific reference to theories of both change and international development -The GMTP Midwife Volunteers have undergone life changing experiences and have formed meaningful relationships with midwives in all three countries. Their enthusiasm and renewed passion for midwifery represent a valuable resource for the RCM, advocating for midwives in the UK and abroad. -South to south learning and networking became a crucial part of the project; future projects will plan for and fund this explicitly. -Recognising that the UK has much to learn from low-income countries, the meaning and process of true exchange, reciprocity and mutuality should be further explored |
| <p>Database search</p> | <p>Sandwell et al. 2018 Stronger together: Midwifery twinning between Tanzania and Canada https://dx.doi.org/10.1186/s12992-018-0442-x</p> | <p><u>Focus</u> To examines one successful twinning relationship between midwifery associations, to analyse how and why it worked, and what benefits it provided</p> <p><u>Twinned countries / regions</u> Canada and Tanzania</p> | <p>The twinning experience was dynamic and rewarding, and both professional associations grew and increased their capacities in ways that could not be foreseen at the outset of the project.</p> <p>Potential facilitators</p> <ul style="list-style-type: none"> -Both midwifery associations were relatively young, meaning they were ambitious and eager to grow. They were sufficiently established with organisational structures, existing constitutions, procedures, policies, and a well-established board of directors. Both organisations had a clear vision and mission statements, and both were familiar with international midwifery through their connections with ICM -The international global health climate and trends in donor priorities had a favourable effect on the initiative |

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| | | | <p>-Participants easily established an interpersonal rapport, some of which was the result of personalities involved. Structural factors may also have played a role in shaping relationships</p> <p>-Participants had experience with international and cross-cultural work.</p> <p>-The Canadian midwifery profession's model of care, which emphasises partnership throughout midwives work, while professionals are also used to being flexible due to their schedules</p> <p>-Funding, both for the initial twinning relationship and for the shared project, played an essential role in supporting the partnership</p> <p>Challenges</p> <p>-The main challenge was communication. Neither skype, nor telephones, nor other internet-based communication technologies function at all times, and for the Tanzanian members, a lack of access to necessary technology and an unreliable electrical power grid sometimes made meetings hard.</p> <p>-Planning meetings across large time differences</p> <p>-Difficulty accommodating busy schedules. Both members worked full-time, many with multiple responsibilities. Midwives could have been called away to attend births, which could impede planned meetings</p> <p>-Maintaining the partnership was more difficult when in-person meetings were not possible</p> <p>-On the contrary to other twinning programs, in this case, it was the person to person twinning initiative that failed and was the weakest aspect of the collaboration. Attempts were made to pair midwives, but relationships faltered and never took root. Members attributed this lack of success to the lack of financial support for the program. There was no funding to support a paid coordinator, and practicing midwives in both countries were too busy to self-coordinate</p> |
| Description of twinning initiative and a case study | | | |
| Google search | Ireland et al. 2015 Twinning in Nepal: the Royal College of Midwives UK and the Midwifery Society of Nepal working in partnership https://ecommons.aku.edu/jam/vol2/iss1/5/ | <u>Focus</u> To describe the importance of collaboration between established national midwifery organisations (Royal College of Midwives) and newly established ones as part of the Global Midwifery Twinning Project and highlights the experience of a UK midwifery volunteer in Nepal | <p>Potential barriers to twinning</p> <p>-Cultural differences between midwifery in the two countries</p> <p>-Wider issues, such as the role and position of women in society</p> <p>Barriers to improving organisational and management skills of a profession and MIDSON</p> <p>-Midwifery is not recognised as a separate profession</p> <p>-Under-usage of more junior midwives</p> <p>-Competing priorities and limited time and energy: no funding for full-time staff and is largely run by volunteers, who have full-time jobs elsewhere</p> |

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| | | <u>Twinned countries / regions</u> Nepal and the UK | |
| Google search | Moyo and Bokosi 2014 Twinning as a tool for strengthening midwives associations https://www.healthynetwork.org/hnn-content/uploads/140419-Twinning-ICM-V04.pdf | <u>Focus</u> Operational manual that covers twinning as a tool for strengthening midwives associations and the twinning process <u>Twinned countries / regions</u> Switzerland and Mali Canada and Tanzania Papua New Guinea and Australia Sierra Leone and the Netherlands | Challenges <ul style="list-style-type: none"> - Cultural differences - Technical divide - Economic divide - Misplaced expectations - Difficulty in operationalising the equal footing concept due to availability or lack of resources - Culture of giving and dependency (donor and recipient cultures) - Difficulty in initiating the relationship effectively Pre-requisites for effective Twinning <ul style="list-style-type: none"> - Equal participation on level ground - All interactions are based on mutual respect, honesty, trust and transparency - There should be organisational integrity with each association honouring its side of the agreement - Prior to beginning the process the associations agree on the form of Twinning - Must be equal contribution to all activities, which are based on a jointly prepared and mutually agreed action plan - this action plan should address agreed challenges and include a budget breakdown that is based on areas needing development in each association - A fundraising plan is vital for sustainability - the most sustainable relationships are those that are self-funded - therefore the associations must consider this from the very beginning - A written commitment is strongly suggested to avoid any misunderstanding between the associations |
| Delphi Study | | | |
| Database search | Cadee et al. 2018 From equity to power: Critical Success Factors for Twinning between midwives, a Delphi study https://dx.doi.org/10.1111/jan.13560 | <u>Focus</u> To gain consensus for critical success factors associated with twinning in midwifery <u>Twinned countries / regions</u> N/A <u>Participants</u> | 25 Critical Success Factors covering issues of management, communication, commitment and values were identified. Most of these focus on equity The findings show that making equity explicit in twinning may contribute towards the agency of midwives to take on their identified key role in sexual and reproductive healthcare |

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| | | 56 Midwife twinning experts from 19 countries | |
| Qualitative study | | | |
| Database Search | <p>Cadee et al. 2021a</p> <p>Paving the way for successful twinning: Using grounded theory to understand the contribution of twin pairs in twinning collaborations</p> <p>https://dx.doi.org/10.1016/j.wombi.2020.01.013</p> | <p><u>Focus</u> To explore the contribution of one-to-one relationships between twins to twinning projects,</p> <p><u>Twinning countries / regions</u> Morocco and the Netherlands; Sierra Leone and the Netherlands</p> <p><u>Participants</u> 13 in-depth interviews with midwives from two twinning collaborations</p> | <p>Four themes were identified</p> <ul style="list-style-type: none"> - Significance of being named a twin - Moving beyond culture to the personal level - Searching for common ground to engage - Going above and beyond the twinning collaboration <p>A complex combination of contextual inequities, personality, and cultural differences affect the twin relationship</p> <p>Trusting relationships promote effective collaboration; however, as ‘trust’ cannot be mandated, it must be built by coaching twins in personal flexibility and (cultural) communication</p> |
| Google search and back chaining | <p>Cadee et al. 2021b</p> <p>Embrace the complex dynamics of twinning!</p> <p>https://doi.org/10.1177/2158244021998695</p> | <p><u>Focus</u> To explore how the professional growth of midwives can be enhanced through twinning collaborations</p> <p><u>Twinning countries / regions</u> Morocco and the Netherlands</p> <p><u>Participants</u> -Baseline open-ended questionnaires (n=16 and 19 individuals from 19 twin pairs) -Focus groups at two time points (midterm and end) (n=18 and 18 individuals from 18 twin pairs)</p> | <p>Cultural differences were capable of both hindering and facilitating professional growth.</p> <p>Facilitators of professional growth</p> <ul style="list-style-type: none"> -Professional growth was facilitated by twins’ preparedness to bridge cultural differences -Common goals positively influenced bridging cultural differences. - A reciprocal equitable environment <p>Barriers to professional growth</p> <ul style="list-style-type: none"> -Midwives were unprepared to bridge cultural differences <p>Recommendations</p> <ul style="list-style-type: none"> -Clear focus on common goals -Consideration of the interaction between the length of a project and the extent of the cultural differences between twins |
| Mixed methods study | | | |
| Google search | Taniguchi et al. 2022 | <p><u>Focus</u> To evaluate the outcomes of</p> | The MACAT was used as an indicator of MMA’s organisational strengthening—first in the year 2015 and then at the end of 2018—for a comparative analysis |

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| | <p>Twinning Project between the Japanese Midwives Association and Mongolian Midwives Association for Organisational Strengthening as Shown by MACAT</p> <p>https://doi.org/10.21203/rs.3.rs-494409/v1</p> <p>Preprint*</p> | <p>the organisational strengthening of the MMA through the twinning project with the JPA</p> <p><u>Twinning countries / regions</u> Mongolia and Japan</p> <p>In the twinning project of the JMA and the MMA, we conducted an obesity prevention programme during pregnancy as a strategic method for strengthening the MMA that involved all members of the MMA branch offices nationwide for three consecutive years, from 2015 to 2018</p> <p><u>Participants</u> Focus group interviews were conducted with 7 current board members and 110 general members of the MMA nationwide in 2018, and were analysed qualitatively</p> | <p>In 2015, 27 (28.1%) of the 96 MACAT items were achieved, while in 2018, 66 items (68.8%) were achieved</p> <p>The average progress rate was 40.7%</p> <p>Items with a high progress rate corresponded to: Governance (50.0%), Management Practices and Leadership (50.0%), Functions (43.8%), and Financial Resource Management (37.5%)</p> <p>Four themes emerged from the interviews: Professional identity, Strengthening midwifery services, Advocacy for midwives, and Recognition of midwives as autonomous professionals</p> <p>Equity and a mentorship approach can serve as key variables of success in international co-operation</p> <p><u>Success Factors</u></p> <ul style="list-style-type: none"> - Good human resources that resolve the barrier of language (use of an interpreter) |
| <p>Google search</p> | <p>Voluntary Services Overseas 2022</p> <p>Evaluation of a twinning partnership; LSHS UK and NDH in Rwanda</p> <p>https://www.vsointernational.org/sites/default/files/2022-05/Evaluation_report_twinning_partnership_final_march_2022.pdf</p> | <p><u>Focus</u> To summarise the main findings, key results and achievements from a final evaluation conducted of the first phase of the twinning partnership project</p> <p><u>Twinning countries / regions</u> UK and Rwanda</p> <p><u>Participants</u> A total of 26 key stakeholders – including clinicians, nurses,</p> | <p>Challenges</p> <ul style="list-style-type: none"> - Insufficient focus on monitoring and evaluation and specifically the absence of indicators to determine what constitutes 'success' for the twinning project - Staff turnover - Communication between the twinned institutions was limited - The issue of communication was also exacerbated by connectivity issues with Rwanda, particularly through online communication channels such as Microsoft Teams or Zoom (Whatsapp is easier). - Reliance on VSO funding and support - - to date, the twinning project has been heavily reliant on VSO funding, brokering and support; while this is expected in the short term, it is clearly not sustainable longer term - Lack of human resources and shortage of staff in the hospital site in Rwanda - Different, uncoordinated IT systems at the UK hospital |

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| | | <p>midwives, laboratory technicians, university student volunteers and VSO staff (former and current) - participated in the evaluation through a combination of 20 key informant interviews and 1 focus group discussion</p> | <p>Facilitators</p> <ul style="list-style-type: none"> - Investing time at the beginning of the partnership to develop relationships between the two institutions, build trust, agree expectations and catalyse leadership and support is key to the ultimate success of the twinning partnership -this process ideally involves bringing people together face to face. - Promoting a co-creational approach, where the twin institutions co-design the scoping and work planning phases of the project - The nature of twinning partnerships – where the emphasis is on reciprocal information exchange, learning and skills transfer- means that new ideas and learning are often generated organically - Conducting a thorough risk assessment is as an integral part of the inception process to identify strategies to mitigate the risks associated with staff turnover Establishing a twinning partnership that builds on existing relationships - A successful twinning partnership is genuinely reciprocal - Strong leadership, commitment mutual respect and personal rapport between the project leads in each twin institution |
| Literature reviews | | | |
| <p>Database search</p> | <p>Cadee et al. 2016</p> <p>The state of the art of twinning, a concept analysis of twinning in healthcare</p> <p>https://dx.doi.org/10.1186/s12992-016-0205-5</p> | <p><u>Focus</u></p> <p>As the definition and understanding of twinning lacks clarity and rigorous monitoring and evaluation are rare, a concept analysis (CA) of twinning in healthcare using Morse’s method was conducted</p> <p><u>Twinning countries / regions</u></p> <p>N/A</p> <p><u>Included studies</u></p> <p>Twinning papers identified (n=19)</p> <ul style="list-style-type: none"> -peer-reviewed research (n=12), -manuals on twinning (n=4), -project reports (n=2), -website (n=1) | <p>Seven of the included papers offered no definition of twinning. In the other twelve papers definitions varied. A new operational definition was developed, as a greater understanding and a mature definition of twinning results in clear expectations for participants and thus more effective twinning</p> <p>Developed operational definition: <i>‘Twinning is a cross-cultural, reciprocal process where two groups of people work together to achieve joint goals’</i>. Pg 8.</p> <p>Four main attributes of twinning in healthcare were identified</p> <ul style="list-style-type: none"> - reciprocity - building of personal relationships - dynamic process - between two named organisations across different cultures <p>The four attributes, and especially reciprocity, can have an empowering effect on healthcare professionals</p> |

| Systematic review | | | |
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| Back-chaining | <p>Dawson et al. 2014</p> <p>Collaborative approaches towards building midwifery capacity in low income countries: a review of experiences</p> <p>https://doi.org/10.1016/j.midw.2013.05.009</p> | <p><u>Focus</u></p> <p>To explore collaborative approaches undertaken to build midwifery education regulation and professional association in low income countries</p> <p><u>Twinned countries / regions</u></p> <p>Partnerships between midwifery organisations and midwives in LMIC (South–South partnerships) or in LMIC and HIC (North–South partnerships)</p> <p><u>Included studies</u></p> <p>Research papers (n=5) Discursive papers (n=15)</p> | <p>A narrative synthesis of the findings section of the five research papers included in this review provided insight into the contribution of collaboration to midwifery capacity building</p> <p>Six themes emerged from the analysis of the findings sections</p> <ul style="list-style-type: none"> - South–South experiences of communities of practice - Education institution development - Skill development - Facility development - Change in midwifery and obstetric practice - Maternal health outcomes <p>Most collaborations focus on building capacity across more than one area and arose through opportunistic and strategic means</p> <p>A number of factors were found to be integral to maintaining collaborations including the establishment of clear processes for communication, leadership and appropriate membership, effective management, mutual respect, learning and an understanding of the context</p> <p>Collaborative action can result in effective clinical and research skill building, the development of tailored education programmes and the establishment of structures and systems to enhance the midwifery workforce and ultimately, improve maternal and child health</p> <p>The review was unable to locate an example of twinning in international midwifery contexts (North to South)</p> |

Key:BMS: The Bangladesh Midwifery Society; GMTP: Global Midwifery Twinning Project; JPA: Japanese Midwives Association; KNOV: Royal Dutch Organisation of Midwives; RCM: Royal College of Midwives; MACAT: The Member Association Capacity Assessment Tool; MIDSON: Midwifery Society of Nepal; MMA: Mongolian Midwives Association; SLMA: Sierra Leone Midwives Association

8. ABOUT THE WALES CENTRE FOR EVIDENCE BASED CARE (WCEBC)

The [WCEBC](#) promotes evidence-based practice through the development and evaluation of internationally excellent systems for evidence appraisal, translation and utilisation.

We operate with a core team in the School of Healthcare Sciences, Cardiff University, and are led by [Dr Deborah Edwards](#) and [Dr Clare Bennett](#).

We work closely with the following organisations: JBI, European Cancer Organisation, World Health Organisation Collaborating Centre for Midwifery Development and the Wales COVID-19 Evidence Centre.

Co-Directors:

Dr Deborah Edwards

Dr Clare Bennett

Contact Email:

edwardsdj@cardiff.ac.uk

bennettcl3@cardiff.ac.uk

Website: <https://www.cardiff.ac.uk/research/explore/research-units/wales-centre-for-evidence-based-care>

9. APPENDIX

9.1. Search strategies

Database: Embase <1974 to 2022 December 15>

- 1 (midwif* or midwiv* or nurs* or doctor* or physician*).ti,ab. (1324447)
- 2 (health* adj2 (worker* or professional* or personnel or workforce)).ti,ab. (261325)
- 3 1 or 2 (1511369)
- 4 (twinning or twinned or twin2twin).ti,ab. (4573)
- 5 (program* or collaborat* or project* or partner* or concept* or relation* or model* or capacity).ti,ab. (9093501)
- 6 3 and 4 and 5 (148)
- 7 limit 6 to english language (147)
- 8 from 7 keep 1-147 (147)

Database: Ovid MEDLINE(R) ALL <1946 to December 15, 2022>

- 1 (midwif* or midwiv* or nurs* or doctor* or physician*).ti,ab. (1036576)
- 2 (health* adj2 (worker* or professional* or personnel or workforce)).ti,ab. (202708)
- 3 1 or 2 (1185122)
- 4 (twinning or twinned or twin2twin).ti,ab. (4864)
- 5 (program* or collaborat* or project* or partner* or concept* or relation* or model* or capacity).ti,ab. (7289910)
- 6 3 and 4 and 5 (59)
- 7 limit 6 to english language (59)

Database: Global Health <1910 to 2022 Week 50>

- 1 (midwif* or midwiv* or nurs* or doctor* or physician*).ti,ab. (122851)
- 2 (health* adj2 (worker* or professional* or personnel or workforce)).ti,ab. (64087)
- 3 1 or 2 (173311)
- 4 (twinning or twinned or twin2twin).ti,ab. (305)
- 5 (program* or collaborat* or project* or partner* or concept* or relation* or model* or capacity).ti,ab. (1252341)
- 6 3 and 4 and 5 (21)
- 7 limit 6 to english language (21)

Database: Ovid Emtree <1995 to 2022 Week 48>

- 1 (midwif* or midwiv* or nurs* or doctor* or physician*).ti,ab. (538725)
- 2 (health* adj2 (worker* or professional* or personnel or workforce)).ti,ab. (129703)
- 3 1 or 2 (631009)
- 4 (twinning or twinned or twin2twin).ti,ab. (703)
- 5 (program* or collaborat* or project* or partner* or concept* or relation* or model* or capacity).ti,ab. (2264499)
- 6 3 and 4 and 5 (28)
- 7 limit 6 to english language (28)

Database: CINAHL: <inception to 16 December 2022>

- S1 (TI (midwif* or midwiv* or nurs* or doctor* or physician*)) OR (AB (midwif* or midwiv* or nurs* or doctor* or physician*)) (837,516)
- S2 (TI (health* N2 (worker* or professional* or personnel or workforce)) OR (AB (health* N2 (worker* or professional* or personnel or workforce))) (131,522)
- S3 TI (twinning or twinned or twin2twin) OR AB (twinning or twinned or twin2twin) (437)
- S4 (TI (program* or collaborat* or project* or partner* or concept* or relation* or model* or capacity)) OR (AB (program* or collaborat* or project* or partner* or concept* or relation* or model* or capacity)) 1,681,866
- S5 S1 OR S2 (928,527)
- S6 S3 AND S4 AND S5 (36)