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REVIEW ARTICLE

Identifying barriers and facilitators of translating research evidence into clinical practice: A systematic review of reviews

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Abstract

Translating research into clinical practice is a global priority because of its potential impact on health services delivery and outcomes. Despite the ever-increasing depth and breadth of health research, most areas across the globe seem to be slow to translate relevant research evidence into clinical practice. Thus, this review sought to synthesise existing literature to elucidate the barriers and facilitators to the translation of health research into clinical practice. A systematic review of reviews approach was utilised. Review studies were identified across PubMed, Scopus, Embase, CINAHL and Web of Science databases, from their inception to 15 March 2021. Searching was updated on 30 March 2022. All retrieved articles were screened by two authors; reviews meeting the inclusion criteria were retained. Based on the review type, two validated tools were employed to ascertain their quality: A Measurement Tool to Assess Systematic Reviews-2 and International Narrative Systematic assessment. The framework synthesis method was adopted to guide the analysis and narrative synthesis of data from selected articles. Ten reviews met the inclusion criteria. The study revealed

that the translation of new evidence was limited predominantly by individual-level issues and less frequently by organisational factors. Inadequate knowledge and skills of individuals to conduct, organise, utilise and appraise research literature were the primary individual-level barriers. Limited access to research evidence and lack of equipment were the key organisational challenges. To circumvent these barriers, it is critical to establish collaborations and partnerships between policy makers and health professionals at all levels and stages of the research process. The study concluded that recognising barriers and facilitators could help set key priorities that aid in translating and integrating research evidence into practice. Effective stakeholder collaboration and co-operation should improve the translation of research findings into clinical practice.

KEYWORDS
barriers and facilitators, evidence translation, healthcare professionals, policy makers, systematic review

1 | INTRODUCTION

The utilisation of knowledge generated from health research to inform and guide clinical practice is recognised as a high global priority (Brownson et al., 2018; Conalogue et al., 2017; Poot et al., 2018). In response to rapid increases in evidence production and knowledge base development, the restructuring of healthcare, insufficient resources and increased professional accountability, many governmental and policy making institutions and funding agencies require evidence-informed clinical practice approaches (Milner et al., 2006). Effective translation of knowledge can improve standards of care and overall health service delivery (Barratt et al., 2017; Langlois et al., 2016).

Knowledge translation (KT) is a term used to explain the activities involved in translating health-related research findings into clinical practice (Gervais et al., 2015). It attempts to assure that stakeholders or 'knowledge users' are familiar with, using and accessing research findings and engaging them as active participants in the research process (Engebretsen et al., 2017; Kreindler, 2018). KT refers to an 'iterative process that includes the synthesis, dissemination, exchange and ethically sound application of knowledge to improve health, provide more effective health services and products and strengthen the healthcare system' (The Canadian Institutes of Health Research, 2016). Understanding and applying the process of KT is therefore essential for alleviating barriers to translating health research evidence into clinical practice.

Despite the increasing amount of health research globally, the process of translating health-related research findings into clinical practice remains slow (Grimshaw et al., 2012; Straus et al., 2011) and the gap between findings and clinical practice is widening (LaRocca et al., 2012). This gap could be related to a wide range of challenges that have been reported in previous studies. Insufficient time (Wallis, 2012), lack of healthcare professionals' motivation (Curtis et al., 2017; Ramón et al., 2022), lack of continuing education (Curtis et al., 2017; Wallis, 2012), uncooperative and unsupportive organisational culture (Ramón et al., 2022; Wallis, 2012) and the disintegration between knowledge producers and users (Norström et al., 2020) are the key barriers to translating research to clinical practice. A clear understanding and assessment of the barriers

What is known about this topic

- Effective knowledge translation has the potential to improve standards of care and overall health service delivery.
- Healthcare professionals' lack of motivation, lack of continuous education, uncooperative and unsupportive organisational culture and the disintegration between knowledge producers and users are the key barriers to the translation of research into clinical practice.

What this review adds

- Various barriers, predominantly individual-related issues and organisational factors affect the translation of health research findings to clinical environments.
- Inadequate knowledge and skills of healthcare staff to conduct, organise, utilise and appraise research literature were significant barriers to the translation process.
- Establishing collaborations and partnerships between policy makers and health professionals at all levels and stages of the research process were the main facilitators of the knowledge translation process.
- A novel application of the Innovative Care for Chronic Conditions model facilitated categorisation of barriers and facilitators to evidence translation in clinical settings.

related to KT in practice can help health systems optimise their use of research evidence and improve the quality of health services provided to patients.

Numerous studies have explored the barriers to translating health research evidence into clinical practice. Oliver et al. (2014) identified challenges that policy makers faced when utilising health research findings, and key obstacles were lack of access to relevant research and lack of timely research output. Lawrence et al. (2019) explored decision-maker involvement in KT. Findings underscored that lack of motivation to update knowledge and lack of experience were the key barriers to utilising KT in practice. Despite these reviews' important findings, most focused on policy makers and gave limited attention to other stakeholders. Further, reviews tended to emphasise barriers to KT as opposed to facilitators. Limited systematic reviews comprehensively address barriers and facilitators to KT. Therefore, the current review aimed to comprehensively synthesise available evidence and provide an overview of barriers and facilitators that enable the translation of health research findings into clinical practice.

The translation process was defined as utilising the Innovative Care for Chronic Conditions (ICCC) model (World Health Organization, 2016). The ICCC model is widely used across studies that include guidelines on how to translate health research evidence effectively. Although the ICCC model targets chronic diseases, it covers three levels of determinants: micro, meso and macro. These three levels allow for the stratification and understanding of KT barriers and facilitators. The model is based on understanding the barriers and facilitators from the policy environment, healthcare organisations and healthcare professionals. It was utilised in previous studies as an analytical framework for identifying barriers and facilitators to provide services to health systems (Abu-Odah et al., 2020). Utilising such an approach could help address barriers and promote the facilitators that alleviate the translation of health research evidence into practice, and the ICCC was adopted as an analytical framework in this systematic review.

2 | METHODS

2.1 | Study design

The study adopted a review of reviews approach to provide a systematic, comprehensive synopsis of the field and identify the current barriers and facilitators to KT. This design allows for the creation and synthesis of high-level evidence generated from reviews (e.g. systematic, scoping, integrative and narrative reviews) in a single document. It also enables the researchers to combine large amounts of data from multiple sources from which they can distil key messages to guide future research. The Preferred Reporting Items for Systematic Reviews and Meta-analyses (PRISMA) guidance was utilised to structure this review (Page et al., 2021).

2.2 | Search sources and strategies

PubMed, Web of Science, Scopus, Embase and CINAHL were searched for reviews published in English from inception to 15 March 2021. Searching was updated on 30 March 2022. The following search keywords, developed based on population, concept and context framework, were utilised for searching: ('translational research' OR 'knowledge translation' OR 'evidence to practice' OR 'evidence-informed' OR 'evidence-based practice' OR 'knowledge exchange' OR 'knowledge interaction' OR 'research utilisation' OR 'research dissemination' OR 'knowledge uptake' OR 'knowledge-to-action' OR 'research diffusion') AND (medicine OR nursing OR 'public health' OR 'health') AND ('challenges' OR 'obstacles' OR 'limitations' OR 'problems' OR 'barriers'). Expressions for 'review*' were also included (see Table S1).

2.3 | Eligibility criteria

2.3.1 | Inclusion criteria

- Reviews (systematic, scoping, narrative and integrative reviews) with a defined and systematic approach to identifying literature (i.e. developing a search strategy and using it to identify data across multiple databases) and reporting barriers or/and facilitators associated with research evidence and clinical practice.
- Reviews incorporating any methodological approach, including those employing qualitative, quantitative and mixed method approaches.
- Reviews focusing on the translation of knowledge evidence into clinical practice.
- Reviews were written in English.

2.3.2 | Exclusion criteria

- Informal literature reviews without defined research questions and do not have defined search processes or discussion papers.
- Other types of articles such as letters, editorials, conference abstracts and short surveys.
- Publications where full-text versions could not be obtained.

2.4 | Data extraction

All papers retrieved from the databases were exported into EndNote X9 software. After removing duplications, the remaining papers were screened independently for eligibility criteria by the first and second authors. The potentially eligible full-text papers were then located for screening by the two main authors, and any disagreements were resolved by the third author. Reasons for excluding papers are reported in Figure 1.

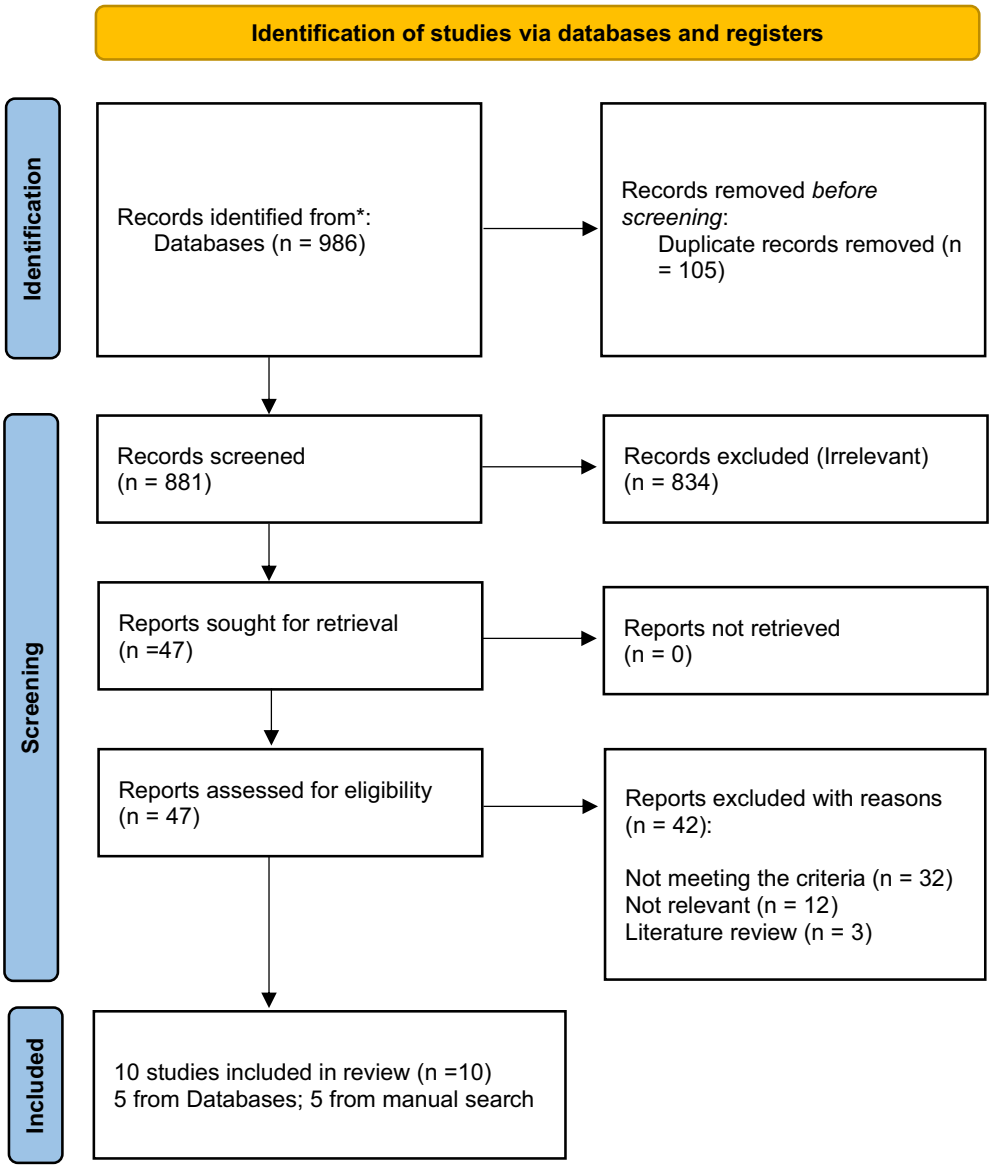

FIGURE 1 PRISMA diagram of the identification of papers

Ten papers were independently extracted by two authors using data extraction sheets developed for this study (Table 1). The data sheets were used to report the following data: (1) citation information, (2) number of studies included, (3) aim of review and (4) main findings (barriers and facilitators) summarised based on the ICCC model.

2.5 | Quality assessment of included reviews

Two authors (HAO and NS) independently utilised two separate validated tools for evaluating the selected reviews. The first is A Measurement Tool to Assess systematic Reviews-2 (AMSTAR-2) (Shea et al., 2017), which is used to assess systematic and scoping reviews. It includes 16 appraisal items; each item is ranked into three levels: yes, no or partial yes. Each review's final score was rated as 'high', which meant the review provided a comprehensive summary of findings, 'moderate', which meant the review had some weaknesses but not critical flaws, while 'low' scores indicated that the review did not provide comprehensive findings and had critical flaws (Shea et al., 2017). The second tool is the International Narrative Systematic assessment (INSA), which is used to assess narrative review papers (La Torre et al., 2015). The INSA tool contains seven appraisal items where each item is rated as 'yes' or 'no'. A paper with a score higher than 5 points is judged as a 'good' quality paper (La Torre et al., 2015).

2.6 | Data analysis

The framework synthesis method (Barnett-Page & Thomas, 2009; Pope et al., 2000) was adopted to guide the analysis and narrative

TABLE 1 Main results of the included papers

Author, Study Year(s), Number of the included paper	Paper aim	Study design and analysis	Population countries	Main results	
				Barriers	Facilitators
Edwards et al. (2019) 2019 62 articles	'To provides a systematic overview of the literature on knowledge translation strategies employed by health system researchers and policymakers in African countries'	A systematic review Narrative synthesis	Healthcare researchers and policy makers African countries	**Micro-level** Deficient skills to perform knowledge translation activities **Meso-level** Insufficient time at the organisation A paucity of resources that help professionals in immersing in health research	**Meso-level** Capacity-building workshops **Macro-level** Providing the most relevant high-quality research
Shayan et al. (2019) 2019 16 articles	'To assess barriers to EBP among nurses in low- and middle-income countries'	A systematic review Narrative synthesis	Nurses LMICs	**Micro-level** Difficulty in appraising research findings Professionals do have not enough time to read and conduct research Professionals are not knowledgeable on how to translate the findings into practice **Meso-level** Scant of the equipment to implement research Scant of needed materials to implement research Difficulties in accessing information Lack of workforce Inadequate facilities to conduct research Lack of teamwork Availability of training research courses Lack of communication between academic Mismatching between research theory and practice.	'Not reported'
Oliver et al. (2014) 2014 145 articles	'To identify new barriers of and facilitators to the use of evidence by policymakers'	A systematic review Narrative synthesis	Policy makers –	**Meso-level** Insufficient time at an organisation that assists professionals to use research findings **Macro-level** Lack of research method skills among policy makers	**Meso-level** Dissemination of research findings, Existence of and access to relevant research. **Macro-level** Collaboration between users and policy makers
Sadeghi-Bazargani et al. (2014) 2014 106 articles	'To systematically review and carry out an analysis on the barriers to evidence-based medicine'.	A systematic review Narrative synthesis	HCPs –	**Micro-level** Lack of skills and understanding of statistic **Meso-level** Availability of equipment and facilities to support research translation Lack of organisational support	'Not reported'
Légaré et al. (2008) 2008 38 articles	'To update a systematic review on the barriers and facilitators to implementing shared decision-making in clinical practice as perceived by health professionals'.	A systematic review Narrative synthesis	HCPs –	**Micro-level** Lack of applicability due to patient characteristics **Meso-level** Time constraints The clinical situation Lack of reimbursement Lack of resources	**Micro-level** HCPs motivation **Meso-level** Positive impact on the clinical process

(Continues)

TABLE 1 (Continued)

Author, Study Year(s), Number of the included paper	Paper aim	Study design and analysis	Population countries	Main results	
				Barriers	Facilitators
Lawrence et al. (2019) 2019 26 articles	'To report how decision-maker involvement in public health integrated knowledge translation research has been described and operationalised and whether the process was evaluated'	A scoping review Narrative synthesis	Policy makers –	**Micro-level** Low involvement of knowledge users Lack of expertise to present significant contributions Lack of motivation to update knowledge **Meso-level** The usefulness of research to the knowledge users' organisation Limited resource use Time constraints Lack of information sharing **Macro-level** No aligning research and policy considerations Conflicting priorities **Others** The language barrier, articles are written in English	**Meso-level** Budgeting for research activities (face-to-face meetings) Excellent interaction for sharing the work **Macro-level** Identifying the right stakeholders Development of trust Development of mutual learning.
Derman and Jaeger (2018) 2018	'To overcome challenges to dissemination and implementation of research findings in under-resourced countries'	Narrative review Narrative synthesis	LMICs	**Micro-level (individual)** Inadequate communication and dissemination	**Micro-level** Consideration in advance of the audience likely to be interested in study findings. **Meso-level** Dissemination of the knowledge gained through our research **Macro-level** Engagement of stakeholders in the early stage of the research process.
Athanasakis (2013) 2013 Literature review	'To review of nurses' research behaviour and the barriers that nurses meet in order to utilise research evidence into clinical nursing practice'	Narrative review Narrative synthesis	Nurses –	**Micro-level** Unaware of HCPs about research Unable HCPs to recognise the quality of research Mistrust of HCPs of the contributions of research findings. HCPs do not see the value of research for practice. **Meso-level** Not enough time to realise research findings Inadequate facilities for implementation **Others** The language barrier, articles are written in English	'Not reported'

TABLE 1 (Continued)

Author, Study Year(s), Number of the included paper	Paper aim	Study design and analysis	Population countries	Main results	
				Barriers	Facilitators
Straus et al. (2011) 2011 Narrative review	'To provide an overview of the science and practice of knowledge translation'.	Narrative review Narrative synthesis	– Global	**Micro-level** Professionals do have not sufficient knowledge and skills to appraise research. Low patients' adherence to recommendations, **Meso-level** Financial disincentives, lack of equipment Standards of care are not aligned with recommended practice.	'Not reported'
Kalassian et al. (2002) 2002 Literature review	To understand the challenges of translating research evidence into clinical in critical care	Narrative review Narrative synthesis	Clinicians –	**Micro-level** Professionals do have not sufficient knowledge and skills to appraise research. No guidelines that inform research Salary and reimbursement **Meso-level** Financial incentives to promote practice guidelines may be expensive Unaffordable practice guidelines either by hospital administration or by key members of the healthcare system. Insufficient resources for implementing evidence-based guidelines. Struggle how to disseminate healthcare policies **Macro-level** Policy makers may be suspicious that there is an unacceptable increase in costs although evidence-based guidelines may improve healthcare.	**Macro-level** Formulating evidence-based guidelines 'Developing and funding specific regional policies'.

Abbreviations: EBP, evidence-based practice; HCP, healthcare professionals; LMICs, low- and middle-income countries.

synthesis of data from selected articles. This synthesis method was used because it offers a robust approach to shaping and synthesising large amounts of textual data (Barnett-Page & Thomas, 2009; Pope et al., 2000) including where varying methodologies may have been used. The initial framework used to explore and organise data was the multilevel World Health Organisation ICCC model that is widely used across studies for data analysis considering multilevel determinants, such as the micro, meso and macro levels (World Health Organization, 2016). The framework includes three levels as follows: the micro-level focusing on individual users, the meso-level focusing on healthcare institutions and systems and, finally, the macro level related to national policies and strategies.

3 | RESULTS

3.1 | Study characteristics

Of 986 articles indexed in five databases, 834 articles were excluded due to not matching the inclusion criteria. The full texts of the remaining articles were screened. Five articles were eligible for inclusion in the review. References from each of the five articles were scanned to check for any additional eligible articles. Five additional articles were included from the screened references. As a result, 10 articles underwent quality appraisal and analysis (Figure 1).

The study revealed that there are different types of included research articles. Of the 10 included articles, five were systematic reviews (Edwards et al., 2019; Légaré et al., 2008; Oliver et al., 2014; Sadeghi-Bazargani et al., 2014; Shayan et al., 2019), four were narrative reviews (Athanasakis, 2013; Derman & Jaeger, 2018; Kalassian et al., 2002; Straus et al., 2011) and one was a scoping review (Lawrence et al., 2019). Three reviews targeted developing countries (Derman & Jaeger, 2018; Edwards et al., 2019; Shayan et al., 2019), one addressed the KT topic from the global perspective (Straus et al., 2011) and the other reviews did not specify the geographic scope (Athanasakis, 2013; Kalassian et al., 2002; Lawrence et al., 2019; Légaré et al., 2008; Oliver et al., 2014; Sadeghi-Bazargani et al., 2014; Straus et al., 2011).

Most reviews primarily assessed policy makers and healthcare system perspectives on KT (Edwards et al., 2019; Lawrence et al., 2019; Oliver et al., 2014), although two reviews investigated nurses' views (Athanasakis, 2013; Shayan et al., 2019) and two investigated healthcare professionals' perspectives on KT (Légaré et al., 2008; Sadeghi-Bazargani et al., 2014). A single review dealt with clinicians (Athanasakis, 2013). Most reviews were published in the last 10 years (Athanasakis, 2013; Derman & Jaeger, 2018; Edwards et al., 2019; Oliver et al., 2014; Sadeghi-Bazargani et al., 2014; Shayan et al., 2019; Straus et al., 2011; Woolf et al., 2015). Two reviews were published before 2010 (Kalassian et al., 2002; Légaré et al., 2008).

Six reviews specified the number of studies they included (Edwards et al., 2019; Lawrence et al., 2019; Légaré et al., 2008; Oliver et al., 2014; Sadeghi-Bazargani et al., 2014; Shayan et al., 2019). Two reviews reported being comprised of over 100 studies (Oliver et al., 2014; Sadeghi-Bazargani et al., 2014), one review included 62 studies (Edwards et al., 2019) and the other reviews included fewer than 50 studies, ranging between 16 and 38 studies (Lawrence et al., 2019; Légaré et al., 2008; Shayan et al., 2019).

3.2 | Quality appraisal of reviews

The methodological quality of the included systematic reviews ranged from moderate to high, meaning that they showed robust and accurate summaries of their findings (Edwards et al., 2019; Lawrence et al., 2019; Légaré et al., 2008; Oliver et al., 2014; Sadeghi-Bazargani et al., 2014; Shayan et al., 2019). Of the four included narrative reviews, three reviews scored ≥5 points, reflecting a good quality paper (Athanasakis, 2013; Kalassian et al., 2002; Straus et al., 2011). Although three reviews were assessed as being of low to moderate quality, quality assessment was not used as a means of determining inclusion in the review. Instead, the quality appraisal was used to inform the current state of the evidence. The three reviews received low-quality grades because they did not report any potential sources of conflict of interest, including the funding they received for conducting the reviews. A detailed methodological quality assessment of the included reviews is outlined in Table S2.

3.3 | Barriers and facilitators

This section presents barriers and facilitators to translating KT into practice. Key findings of reviews were structured into the three ICCC levels such as micro, meso and macro. These findings are presented as follows: (1) barriers to KT and (2) facilitators or contributing factors to KT (Figure 2).

3.3.1 | Micro-level (individuals)

Individual barriers focused on healthcare professionals' abilities to conduct, read, use or translate evidence into clinical practice. Findings revealed that limited professional engagement in the research process, lack of time, insufficient critical appraisal skills and an inability of healthcare professionals to use the research findings and recommendations in clinical practice were the most common individual-level challenges (Edwards et al., 2019; Shayan et al., 2019). Moreover, low technology literacy levels and unfamiliarity with research databases were barriers to healthcare professionals' understanding and use of research (Athanasakis, 2013; Lawrence et al., 2019). These factors created an obstacle in the translation of research evidence into clinical practice.

Other barriers, such as professionals' unfamiliarity with evidence-based practice concepts (Shayan et al., 2019), lack of interest in updating knowledge on emerging best practices (Lawrence et al., 2019), and underestimation of the value of research were additional barriers identified at the individual level (Athanasakis, 2013;

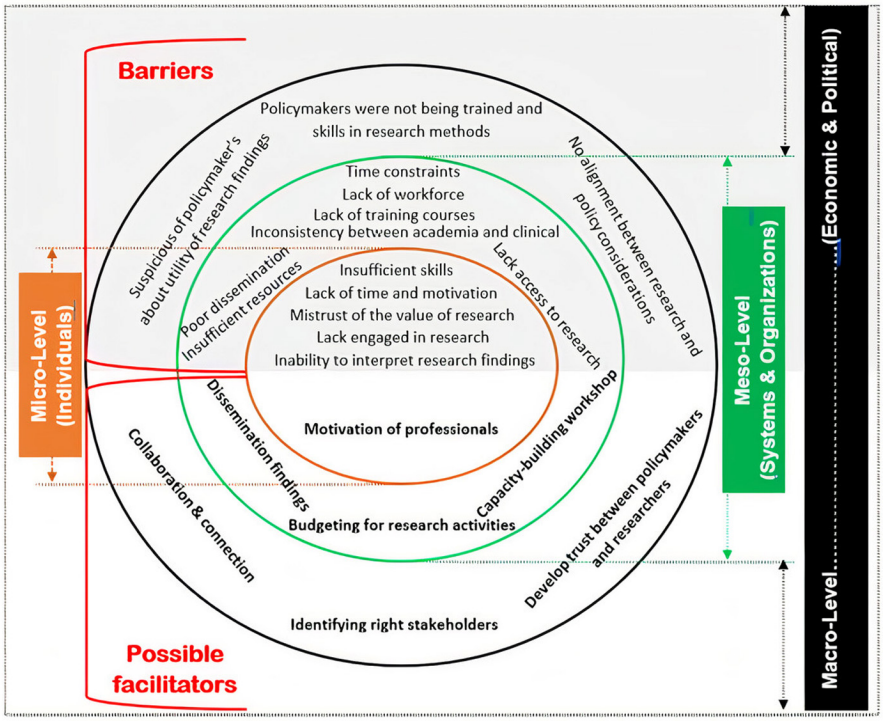

FIGURE 2 Barriers and facilitators of uptake of evidence into clinical practice

Lawrence et al., 2019). Not only did healthcare professionals lack the capabilities to interpret findings from studies but also to understand statistical measures utilised in research (Sadeghi-Bazargani et al., 2014).

The facilitators for overcoming micro-level challenges healthcare professionals' motivation and interest (Légaré et al., 2008) in addressing and studying research findings, given suitable packaging and targeted communication of results (Derman & Jaeger, 2018).

3.3.2 | Meso-level (systems or organisations)

This level includes systemic or organisational barriers such as education, training, resources, services, policies and organisation culture. Time constraints, insufficient organisational resources, poor knowledge dissemination and lack of access to evidence and research were the most commonly reported barriers (Athanasakis, 2013; Edwards et al., 2019; Lawrence et al., 2019; Légaré et al., 2008; Oliver et al., 2014; Shayan et al., 2019). Insufficient resources (materials and equipment) required for the implementation of research and inadequate facilities to conduct research were reported in three studies (Derman & Jaeger, 2018; Edwards et al., 2019; Kalassian et al., 2002; Lawrence et al., 2019; Légaré et al., 2008; Sadeghi-Bazargani et al., 2014).

Inadequate organisational, political, technical and financial support was the second most frequently cited barrier to translating evidence into clinical practice. Workforce shortage was reported as an additional organisational challenge (Shayan et al., 2019). Inappropriate management, organisation of staff and workload density made it difficult for staff to allocate work time to searching and reading research papers or synthesise evidence and guidelines (Shayan et al., 2019). There were additional barriers specific to KT in nursing practice, including lack of training and educational opportunities for research (Shayan et al., 2019) and limited co-operation among educational and clinical environments or entities (Shayan et al., 2019).

Institutional support for the translation of evidence into practice can come through a policy or plan to implement various capacity-building activities such as workshops. Dissemination of primary research findings across organisations (Derman & Jaeger, 2018; Oliver et al., 2014) and budgeting for research activities were supplementary capacity-building facilitating actions to support institutional KT (Derman & Jaeger, 2018; Oliver et al., 2014). A unique but important facilitator was the development and establishment of mechanisms and channels for effective, sustainable communication to build a shared understanding and experience of the work (Lawrence et al., 2019).

3.3.3 | Macro-level (economic and political)

This level focused on policy makers' issues that support translating evidence into clinical practice such as guidelines, partnerships and regulations. Three reviews revealed that political challenges are a key impediment to the translation of health research evidence into clinical practice (Kalassian et al., 2002;Lawrence et al., 2019; Oliver et al., 2014). Policy makers were not sufficiently trained and skilled in research methods (Oliver et al., 2014) and did not perceive or observe alignment or integration between research and policy (Lawrence et al., 2019). In addition, they remain doubtful about the utility of research findings (Kalassian et al., 2002).

The main macro-level facilitators reported in the two reviews were identifying the stakeholders and developing robust

collaboration and connections between policy makers and research staff (Lawrence et al., 2019; Oliver et al., 2014). These can be achieved by building technology, such as web-based conferencing platforms, and supporting its capacity. This technology provides policy makers with updated information and knowledge in research and engages them in all research priorities, which helps them make evidence-based decisions (Lawrence et al., 2019). Additional facilitators play a significant role in translating evidence into clinical practice, including developing trust across policy makers and researchers (Lawrence et al., 2019) and developing guidelines that promote clinical best practices (Kalassian et al., 2002). It is also important to involve stakeholders early in the research design and initiation process, as they are most likely to be affected by research output (Derman & Jaeger, 2018).

4 | DISCUSSION

This review sought to provide a comprehensive and systematic mapping of the barriers related to translating research findings to clinical practice. It further articulates possible facilitators that strengthen this process. The included primary reviews highlighted that the translation of health research findings into a clinical environment is affected by various barriers, predominantly individual-related issues and those relating to organisational factors. It was identified that inadequate healthcare professionals' knowledge and skills inhibited their ability to conduct, organise, utilise and appraise research literature; these were significant barriers to the translation process. Conversely, key stakeholder collaboration was highlighted as a crucial facilitator.

Translation of health research evidence to real-world environments is pivotal for the success of any clinical practice or implementation of health policy (Bahadori et al., 2016; Bayuo, 2017). However, the translation process is often wrought with multiple barriers, as reported in this review. Inadequacy of individuals' knowledge and skills to conduct, organise, utilise and appraise research literature are the main individual-related barriers to translating research findings into clinical practice. These results are congruent with previous studies, highlighting that the lack of sufficient skills to appraise, interpret and utilise research findings deepens the research–practice gap (Bahadori et al., 2016). Training and engaging professionals in research practice, including the identification and use of research evidence, may be essential to boost their knowledge and skills to participate in the research process and interpret the findings (Mickan et al., 2017).

Additional barriers to research translation identified in this study included a lack of research education leading to disinterest, motivational challenges and scepticism over the potential of research evidence to be translated into clinical practice (Bahadori et al., 2016; Curtis et al., 2017). Several healthcare systems have invested considerably in addressing these knowledge barriers over the last two decades (Grimshaw et al., 2012). For instance, practice guidelines were in part developed to reduce the time needed for sourcing and reading research papers. The investment was also focused on reaching electronic libraries of open access evidence sources to enhance access to research articles and training to enhance research literacy skills (Grimshaw et al., 2012). However, these investments have confronted additional challenges, such as staff shortages, which limit clinicians' capacity to engage with and review research, irrespective of its format (Bahadori et al., 2016).

A lack of interest in the research process is another significant individual-level barrier noted in this study. The factors driving engagement and interest in research are likely to be multifaceted, potentially ranging from individual perceptions of the value of research to wider systemic issues such as limited clinical academic career pathways that would further enhance one's research skills (Brandenburg & Ward, 2022). At the micro level, translational barriers may also be reduced by motivating healthcare professionals. Individual-level facilitators involve a clear understanding of the target population, who could benefit from the research findings, so that the research evidence can be customised and communicated in a practical way to enable easy translation. Our results are aligned with previous reports indicating that successful dissemination and utilisation of research evidence can be achieved following the identification of the right audience and tailoring of messages using appropriate mediums (Curtis et al., 2017; Kothari & Wathen, 2017; Van der Graaf et al., 2018).

At the organisational level, translating research into the clinical environment requires resources. A lack of resources, such as limited access to research databases and the requisite equipment for them (such as IT infrastructure), is the leading organisational barriers to applying research findings in the clinical setting (Curtis et al., 2017). Lack of resources also indirectly affects the professional development of staff. Time constraints, heavy workload and lack of an adequately skilled workforce to read and understand research processes limit the translation of research into clinical practice. Existing literature aligns with these findings (Bahadori et al., 2016; Edwards et al., 2019); time was reported as an essential factor for utilising research evidence in clinical environments (Bahadori et al., 2016). A study conducted in eastern Turkey underscored that 'the lack of time to implement the new ideas in the workplaces' and 'the lack of sufficient time for reading the studies' were the most common barriers to translating research findings into clinical practice (Tan et al., 2012).

Our observations indicate policy makers' mistrust in the potential of translating research into clinical practice. This affects both health policy development and systematic public investments in research programmes. A sizeable proportion of policy makers' mistrust stems from their lack of research skills. Early identification and partnering with all key stakeholders (policy makers, evidence producers and the beneficiaries of research, such as the community) may overcome this challenge. Similar models have been suggested in earlier studies (Ongolo-Zogo et al., 2018) with, for example, technology-driven interactive models providing all stakeholders and beneficiaries with constant engagement and updated information to enable them to support evidence-based models (Cairney & Oliver, 2017; Van der Graaf et al., 2018). Alongside inclusion and participation of key stakeholders, focusing on transparency and accessibility of timely research findings, can ensure that policy makers access and engage with research findings (Donnelly et al., 2018).

4.1 | Strengths and limitations

Using a deductive approach to ascertain the barriers and facilitators may not have allowed for new and emergent insights to arise from the literature. However, the framework approach provided a useful way of structuring and mapping the key findings and literature in this area. A strength of our study is in the identification and stratification of the barriers and facilitators at three levels, which can help with devising targeted strategies to overcome identified challenges.

5 | CONCLUSIONS

This systematic review highlights the key barriers and facilitators for translating research to clinical practice at the individual and organisational levels. Research evidence is essential to improving healthcare practice, thereby also enhancing patient outcomes. By adopting an approach that explored factors at the individual and organisational levels, our findings can guide the development of targeted interventions to overcome the identified barriers. Furthermore, wider efforts to foster effective collaboration and co-operation between all stakeholders could lead to improvements in the translation of health research findings into clinical practice.

AUTHOR CONTRIBUTIONS

HAO led this systematic review. NS was the second reviewer for the data extraction and analysis. SCN supervises HAO and NS and provided oversight to this review. SCN and ME provided input on the discussion and conclusions. All authors contributed to drafting the manuscript.

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DATA AVAILABILITY STATEMENT

Data sharing is not applicable to this article as no new data were created or analysed in this study.

ETHICS APPROVAL

Ethical approval was not required for this study because it used data from published papers.

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