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Capacity development for knowledge mobilization: a scoping review of the concepts and practices

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There is a growing emphasis worldwide on the use of knowledge mobilization (KMb) to improve policies and practices with the latest research evidence. This emphasis calls upon knowledge producers (e.g., university researchers) to produce more relevant evidence, and knowledge users (e.g., practitioners) to access and apply evidence. However, doing KMb can be challenging for these groups without effective support and training. Therefore, individuals and organizations are undertaking capacity development interventions to facilitate the KMb process with more effective support structures, skills, and incentives. Despite its recognized importance, theoretical evidence and practical guidance on capacity development for KMb are scattered across disciplines and practices. To address this, we conducted a scoping review study to review the current practices and concepts and identify significant gaps. One-thousand six-hundred thirty records were gathered, and 105 peer-reviewed and gray literature documents from 2010 to 2020 were reviewed. Two reviewers worked independently in screening the records, and one researcher analyzed the retained documents. The analysis reveals that capacity development for KMb is a multidimensional and multiscalar concept and practice with a diverse range of initiators, initiatives, and beneficiaries. This study also reports on three thematic areas of significance emerging from the literature, namely: (a) individuals' and organizations' challenges in doing and supporting KMb, (b) the capacities and supports deemed needed for effective KMb, and (c) the strategies being used for delivering capacity development. Furthermore, this study identifies evidence gaps related to the process aspects of capacity development for KMb (i.e., planning), capacity development initiatives being undertaken in developing country contexts, and results from more formal evaluations of KMb capacity-building effectiveness.

Introduction and background

Calls for stronger links between research evidence and policy and practice have become commonplace across nearly all fields of study in the past 15 years (Powell et al., 2018; Graham and Tetroe, 2007; Lal et al., 2015). In the field of education, for instance, researchers have established a rich knowledge base over the past decades that could improve educational practices and help address a wide range of educational challenges. However, many studies report a considerable gap between actual classroom practices and the potential of

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research evidence from educational studies (Cain, 2017; Borg, 2009; Schaik et al., 2018). The use of research knowledge to improve educational practices and administration has continued to be described as low, infrequent, intermittent, and inadequate (Lysenko et al., 2015; Lysenko et al., 2014; Zuiker et al., 2019; Powell et al., 2018).

To address this gap, research organizations have adopted a range of strategies, generally referred to as knowledge mobilization (KMb), to facilitate and maximize the use of research evidence by knowledge users (Davies et al., 2015; Cooper, 2014). KMb is understood as the reciprocal flow of knowledge and expertize between academics, practitioners, policymakers, and intermediaries that act to facilitate this knowledge flow (Social Sciences and Humanities Research Council, 2019). Alongside this growing emphasis on KMb, the literature on the processes, challenges, and incentives for knowledge mobilization has grown substantially (Powell et al., 2018). A growing set of terms such as knowledge translation, knowledge exchange, and knowledge mobilization has also appeared in the literature, which refer to closely overlapping concepts of mobilizing research evidence into practice and policy (Bielak et al., 2012; Phipps et al., 2012; Mallidou et al., 2018).

Despite this growing attention, the process of mobilizing knowledge with a view to creating impact remains slow and unpredictable, which reduces the perceived benefits of investments from public resources in scientific research (Edwards et al., 2019). A range of challenges has been cited as obstacles to increasing or accelerating the uptake of research evidence through KMb, with insufficient resourcing and limited KMb competencies being among them (Mallidou et al., 2018; Cooper et al., 2018; Ellen et al., 2013). Moreover, previous research highlights an inconsistency between research organizations' mission statements about KMb and the actual practices they pursue and the support they offer for engaging in KMb and creating impact (Sá et al., 2011; Fischman et al., 2018). These challenges point to capacity development for knowledge mobilization as an important approach to facilitate KMb practice among individuals such as researchers and practitioners (Cooper et al., 2018; Bayley et al., 2018). Capacity development is defined as "the process by which individuals, groups and organizations, institutions and countries develop, enhance and organize their systems, resources and knowledge; all reflected in their abilities, individually and collectively, to perform functions, solve problems and achieve objectives" (OECD, 2006). This definition is congruent with the conceptualization of knowledge mobilization in the academic literature because it highlights multi-directionality (top-down and bottom-up), acknowledges the role of both individuals and organizations, provides comprehensive scope (systems, resources, and knowledge), and affirms context specificity.

Despite the importance of capacity development for KMb, this process has theoretical and practical challenges. Most notably, the literature on capacity development for KMb, including practical guidance, is both limited and fragmented, with studies spread across different disciplines and contexts (Dagenais et al., 2016; Orem et al., 2014; Bennett et al., 2016). This challenges further research on capacity development for KMb, and it could threaten the success of capacity development initiatives. Second, although some studies have evaluated the individual and organizational challenges in the KMb process (Oliver et al., 2014; Golhasany et al., 2020), our understanding of the key factors that could make capacity development for KMb more effective remains limited (Tetroe et al., 2008; Murunga et al., 2020). Especially important is that the intended beneficiaries of capacity development, such as academic researchers, tend to have had little voice over initiatives' outcomes and processes (McLean et al., 2018). Finally, challenges around capacity development for KMb are complicated by the inconsistency between KMb's theoretical literature (i.e., what research theorizes to be working) and KMb practice (i.e., what is being done in practice). In other words, research shows that the practice of operationalizing capacity development for KMb is highly variable, and in some cases has not been evidence-based (Ward, 2020).

Given the gaps in our understanding of capacity development for KMb, we argue that studying the available theoretical and empirical literature may be instrumental in informing future studies and designing and implementing more effective capacity development initiatives. Due to the complex, understudied, and dispersed nature of the evidence available area of study, a scoping review was deemed the most appropriate methodological approach (Kastner et al., 2012). This scoping review aims to (A) obtain a broad picture of KMb capacity development practices and concepts in the literature and (B) identify the gaps in the literature and documented practices that might negatively affect capacity development initiatives and practices.

The following section of the paper describes our methodological choice and procedure for reviewing the literature. Then, we examine the literature on capacity development for KMb and present the three themes that emerged from it. Finally, the discussion section evaluates our findings against previous understandings.

Methods

Scoping studies (or reviews) are defined as "exploratory projects that systematically map the literature available on a topic, identifying key concepts, theories, sources of evidence and gaps in the research" (Canadian Institutes of Health Research, 2010, para: "scoping reviews"). They are often carried out to identify different types of evidence, clarify concepts and definitions, examine research methodologies conducted on a certain topic or field, and identify key characteristics or factors related to a concept (Munn et al., 2018; Tricco et al., 2016). For this study, we followed the method outlined by Arksey and O'Malley (2005), which sets out five stages for the review process: (1) formulating the research question; (2) identifying relevant studies; (3) selecting the literature; (4) charting the data; and (5) collating, summarizing, and reporting the results. The sixth step in this method (i.e., consulting with stakeholders to inform or validate study findings) is optional (Arksey and O'Malley, 2005) and not included in the results reported here. Additionally, to provide more transparency to the research process, this study followed the Preferred Reporting Items for Systematic Reviews and Meta-Analyses extension for scoping reviews (PRISMA-ScR) (Tricco et al., 2018). The study's protocol was reviewed by two expert academics before its commencement and is available online (Supplementary Table S1).

Formulating the research question. The key objective of this review is to consolidate the available knowledge of capacity development for KMb, including the key concepts and practices, and identify noticeable gaps in the current literature. Therefore, our approach to the study spanned a range of fields, regions, study designs, terminologies, study types (i.e., empirical or conceptual analyses), and publication types (i.e., both peer-reviewed and gray literature). This broad scope was necessary to capture the wide range of studies constituting this field's literature. Accordingly, the study followed this research question: *How has capacity development for KMb been conceptualized and operationalized to date, based on peer-reviewed and gray literature?* In this research question, the guiding elements were both conceptual (e.g., What is capacity development for KMb?) and operational

Table 1 Capacity development definitions and categories of analysis.

Capacity development features and definitions	Categories and distribution ($n = 105$)
Initiator: The party that plans or implements capacity development initiatives by making investments or leading programming.	Individual (49%), organization (31%), government (20%)
The beneficiary group: The intended participants or targeted audience for the capacity development initiatives.	User individual (32%), user organization (20%), producer individual (14%), producer organization (6%), unidentified beneficiaries (26%)
Region: The region where the capacity development initiative took place, if specified. If the region of capacity development was not identified (e.g., review papers), the region of the first author's affiliated organization was used.	North America (47%), South America (0.1%), Africa (12%), Europe (19%), Asia (4%), Australia and Oceania (17%)
Field: If specified exactly, the scientific field where the capacity development initiative took place. If the scientific field was not identified (e.g., review papers), we categorized them as unidentified.	Health (79%), Education (7%), Multidisciplinary or unidentified (14%)

(e.g., how is capacity development undertaken in practice across different contexts?).

Identifying relevant studies. As noted above, our study aimed to capture the full breadth of fields and sources, including gray literature that is not indexed in academic databases (Berrang-Ford et al., 2015). We developed our search strategy in consultation with a university librarian, which comprised of the following: (a) searching for peer-reviewed publications through the following databases: Scopus, ERIC (ProQuest), PubMed, EBSCOhost and Web of Science; and (b) searching in Google Scholar for gray literature.

There is an inherent complication related to the search terms for this scoping review. KMb and capacity development terminology can vary across and within disciplines, even though these concepts are systematically linked and refer to similar functions (Bielak et al., 2012). To address this, we used a range of search terms related to KMb and capacity development. These included: "knowledge broker*", "knowledge mobili*", "knowledge transfer*", "knowledge translat*", "knowledge exchange", "capacity building", and "capacity development". Boolean operators AND and OR, along with advanced search strategies in the databases were used. In databases where proximity search options were allowed, namely Web of Science, ERIC, and Scopus, the terms strengthen* and support* along with build* and develop* were used to search with proximity (set within the range of two words).

For instance, the search strategy for Scopus included using the following string: "knowledge broker*" OR "knowledge mobili*" OR "knowledge transfer*" OR "knowledge translat*" OR "knowledge exchange" AND capacit* W/2 (build* OR develop* OR strengthen* OR support*). All databases were searched on June 8th, 2020, and a search limit was applied for the English language with a publication date of in and after 2010. This was done to focus on the results that align with the recent developments in the KMb field and to make the study scope more feasible.

Despite the challenges of including gray literature (Tricco et al., 2016), we recognize that there may be considerable evidence on capacity development initiatives captured in institutional reports, working papers and policy briefs that should not be overlooked. To include evidence from gray literature in a practical approach, we followed practices set out in past research and only reviewed the first ten pages of the Google database for the search string used (Azevedo Perry et al., 2017; Bradford et al., 2016).

Screening and selecting the studies. The authors compiled the titles and abstracts of gathered records and then removed duplicates using EndNote software. In the first level of selection, two researchers read the titles and abstracts with two criteria for selection. Testing the reliability of the first screening indicated 85% agreement among the researchers with a Kappa score of 0.64, which is acceptable for interrater reliability, considering our study's scope and variability of terminologies (McHugh, 2012). All discrepancies were discussed among the researchers. Based on our research objectives, we set the following criteria at the first level of screening (titles and abstracts):

1. Does the title or the abstract of the document point to the goal for increasing the uptake of knowledge in practice, policy or production of products as the central focus of the document?
2. Does the title or the abstract of the document point to developing, enhancing and organizing individual or collective systems, resources and knowledge to perform KMb functions as the central focus of the document?

The second screening level involved reading the records in full text to ensure they passed our selection criteria. At the second screening level, our scoping review targeted documents with a clear focus on capacity development for KMb. The reason for different screening levels was to achieve more explicit focus on capacity development for KMb in the selected records. Therefore, studies focusing on capacity building more broadly (for instance, building research capacity); or documents on KMb practice without a clear capacity development element were excluded. All conceptual and empirical studies (e.g., case studies, commentaries, and review papers) were included except protocol papers. The criterion for the second screening level asked: Does this study provide specific empirical evidence or conceptual guidance on developing, enhancing and organizing individual or collective systems, resources and knowledge to perform KMb?

Charting the data. Once the final selection of papers was identified, one researcher read each document to chart the data on some predetermined features (Table 1) related to capacity development for KMb. Charting the data based on the initial framework helped us to have a systemic approach in analyzing the documents and obtaining a broad picture of included concepts and practices. Two researchers piloted data charting of ten documents, and then one researcher continued with the rest of the documents (Supplementary Table S2). The following are the features or dimensions that were used for charting the data:

It should be noted that categorizing every document based on predefined criteria is difficult (Glegg et al., 2019; Bornbaum et al., 2015). This is because of the included documents' variability and the present study's broad scope (Arksey and O'Malley, 2005). For instance, some studies lacked adequate reporting, referenced necessary information in other unincluded documents, or could be placed in multiple categories.

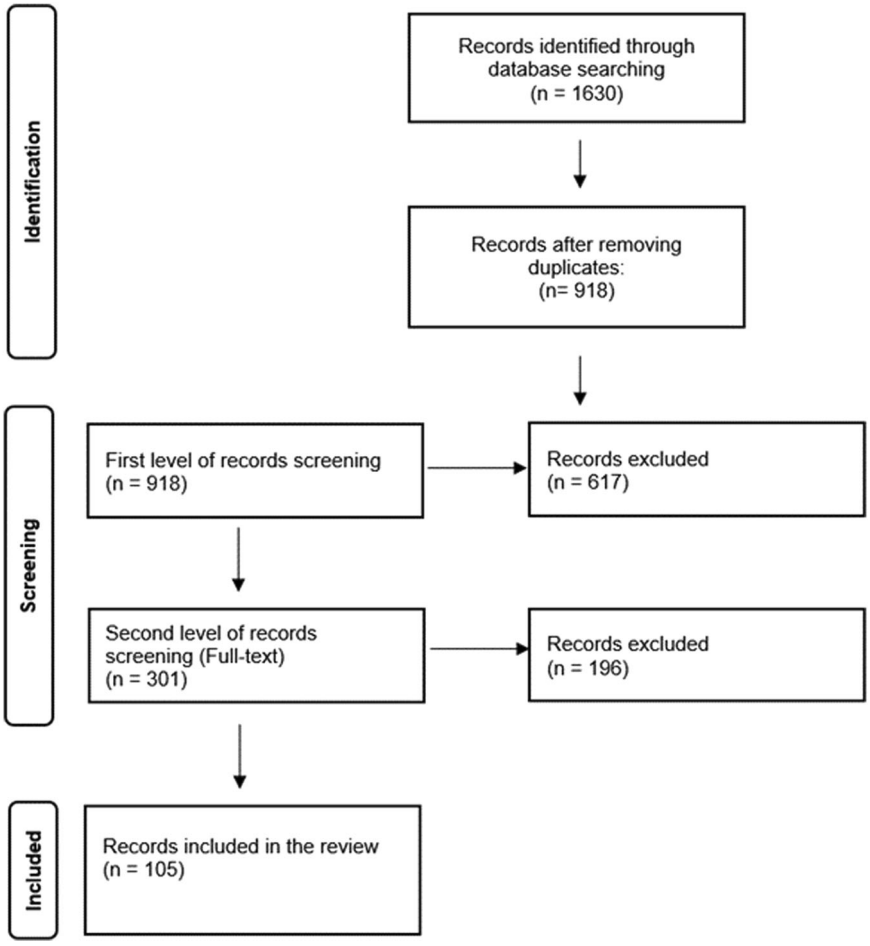

Fig. 1 Document screening process. This flow diagram illustrates the steps of the screening process used in the scoping review. It is based on the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) protocol (Page et al. 2021).

Summarizing and reporting the results. To summarize the data found in the included studies, we followed Arksey and O'Malley's (2005) data analysis approach, paying special attention to the process, rationale, and contexts identified in each study. The analysis continued with an iterative and reflective process of reading extracted information, referring to the original studies and discussing the emerging key themes among the researchers. The narrative accounts for the underlying elements within these themes and highlights the literature's gaps, dominating issues, major trends, and broader practice implications (Levac, 2010).

Findings

This study collected a total of 1630 records from various sources, including 472 from Scopus, 30 from ERIC (ProQuest), 202 from PubMed, 284 from EBSCOhost, 542 from Web of Science, and 100 from Google Scholar. After screening these records, 105 of them were deemed eligible for inclusion (see Fig. 1). Among the included records, 102 were peer-reviewed published studies and three were classified as gray literature (i.e., they were not from traditional academic or commercial publishing channels). The gathered records also included conceptual papers (e.g., commentaries), empirical papers, case studies, and review papers. The majority of the gathered literature were health-related studies, followed by education studies, while the remaining studies were either multidisciplinary or did not specify their field of focus. Moreover, most studies came from developed countries (namely, Canada, Australia, and the UK), with very few coming from developing country contexts. This distribution is noteworthy, given the pressing need for evidence-informed and contextually relevant policy and practice in developing countries as well.

What information and priorities inform the initiation of capacity development for KMb? In the literature on capacity development for KMb, studies often start by describing the challenges knowledge producers or users face in doing KMb and then propose initiatives to develop capacities for supporting and facilitating this process. This challenge description varies from engaging exclusively with the academic literature to scoping their target group's specific challenge and context. This scoping usually consists of identifying, contextualizing, and delineating the bounds for the specific KMb challenges of the intended beneficiary. Scoping allows for establishing a logical relationship between the identified challenge, necessary capacities, potential delivery strategies, and contextual factors such as assumptions, values and available resources. This is often referred to as tailoring or contextualizing capacity development initiatives (Leeman et al., 2015; Bennett et al., 2016; Fairbrother et al., 2016; Leeman et al., 2017; Dobbins et al., 2018; Dobbins et al., 2019; Moore et al., 2016). The scoping process also provides a baseline for KMb challenges that is important for evaluating the outcomes and impact of the intervention (MacGregor et al., 2013; Uneke et al., 2015a; Dobbins et al., 2019; Williamson et al., 2019).

Despite the importance of scoping KMb challenges for capacity development, we found instances in the reviewed texts where studies do not provide a clear case of the KMb challenges and the affected groups. This can especially occur when new mandates or

leadership in organizations prioritize KMb, when new government funding is provided, or in review studies of capacity development with a general sense of KMb challenges. This section reviews the methods used to undertake a scoping of KMb challenges, as well as the most common challenges cited in the literature as the basis for capacity development for KMb. In the documents that we reviewed, 45% (47 of 105) reported undertaking a scoping of the KMb challenges relevant to capacity development. Specifically, among these 25% (12 of 47) discussed establishing a capacity baseline, 34% discussed knowledge users' KMb challenges (16 of 47), 15% discussed knowledge producers' (7 of 47), and 40% discussed challenges in organizations (20 of 47).

The first major sub-theme emerging from this literature is insufficiently established KMb baselines or the lack of data in this regard in the literature on capacity development for KMb. In our review, some studies highlighted the lack of information about the current capacity of individuals and organizations in many KMb capacity development initiatives. Accordingly, evaluations and assessments were carried out or proposed to understand the current capacity to produce and use relevant evidence (Ellen et al., 2013; Waqa et al., 2013; Uneke et al., 2015a; Stamatakis et al., 2017; Uneke et al., 2017b; Visram et al., 2018; Bornbaum et al., 2015). Understanding current capacity can help to identify strengths and areas where improvements are most needed. Moreover, this understanding will help to ensure initiatives' suitability for particular contexts and realities (Stamatakis et al., 2017; Haynes et al., 2018) (Wilson et al., 2011; Makkar et al., 2016; Brennan et al., 2017). For this purpose, measures such as Is Research Working for You? (Dobbins et al., 2018), Staff Assessment of engagement with Evidence (SAGE) (Makkar et al., 2016), Seeking, Engaging with, and Evaluating Research (SEER) (Brennan et al., 2017), and Organizational Research Access, Culture and Leadership (ORACLe) (Makkar et al., 2016) were developed or used in the literature to obtain a picture of current capacities to engage in KMb.

Knowledge user challenges. On the individual user side (e.g., decision-makers, practitioners), limited skills and motivations for accessing, interpreting, and applying evidence are reported as significant barriers to increasing the uptake of evidence (LaPelle et al., 2006; Leeman et al., 2017; Uneke et al., 2017a, b; Dobbins et al., 2018; Edwards et al., 2019; Barratt and Fulop, 2016; Gray et al., 2013; Moore et al., 2018; Ongolo-Zogo et al., 2018). Furthermore, the literature indicates that the existence of multiple sources of information that are not completely research-based, as well as the knowledge users' limited ability to evaluate research and connect it to their practices, might be a contributor to low and infrequent use of research (Cooper et al., 2017; Visram et al., 2018). Beyond research access/application skills, other important challenges are developing a favorable attitude toward evidence use, managing time constraints, and obtaining institutional support and resources (Barratt and Fulop, 2016; Brennan et al., 2017; Holmes et al., 2014; Eames et al., 2018; Tate et al., 2019).

Knowledge-producer challenges. At the individual knowledge-producer level (e.g., researchers), studies most prominently confirm the role of organizations in either supporting or limiting KMb engagement. Studies report that the most significant challenges to researchers' participation in KMb are related to the traditional institutional rewards systems that prioritize research productivity over other performance metrics (Cain et al., 2018; Cooper et al., 2018; Lal et al., 2015; Murunga et al., 2020). Another major challenge to researchers is the lack of necessary institutional support for KMb, which limits access to KMb funding, training, and infrastructure (Cooper et al., 2018). Beyond the role of organizational supports, researchers' inadequate knowledge of the current landscape of policy and practice, limited ability to link and engage with non-academic partners, and difficulties in collaborating with non-academic partners have been described as other key challenges (Barwick, 2016; Lal et al., 2015; Edwards et al., 2019; Reed et al., 2014).

Organizational challenges. An important challenge in organizations is aligning organizational priorities, culture, and KMb strategy with the amount of support individuals need to engage in KMb. Therefore, studies that focus on improving alignment between organizational priorities and reward structures for doing KMb often discuss cultivating culture shift or culture change in organizations (Barreno et al., 2013; Przybycien et al., 2011; Ellen et al., 2013; Ayah et al., 2014; Dobbins et al., 2018; Kislov et al., 2018; Smits et al., 2018; Williamson et al., 2019). Other important barriers include resistance to change (Glegg and Hoens, 2016), unclear communication (e.g., clarity of mandates, and roles), insufficient organizational funding, limited access to KMb resources (Yost et al., 2014; Dobbins et al., 2019; Smits et al., 2018; Albers et al., 2020), and ineffective management and leadership for leading initiatives (Briggs et al., 2010; Masood et al., 2018; Hunter et al., 2019; Moore et al., 2016; Kislov et al., 2014; Kislov et al., 2017).

How are capacities being targeted? This section highlights the most common processes that capacity development studies and initiatives have undertaken to align the identified KMb challenges described above with capacities needed to undertake and support KMb. More specifically, after describing the challenges in doing KMb, capacity development literature typically discusses the necessary competencies or organizational structures needed to overcome these challenges. This discussion can be about which capacities are necessary, how they are identified, and why they are prioritized over others based on contextual factors and goals. In these discussions, studies often select a particular approach or process to target a list of necessary competencies for doing and supporting KMb. This linking process is significant because it affects the relevance of initiatives to the needs and challenges of capacity development beneficiaries. In other words, different approaches to this process could result in the selection of different sets of targeted capacities and different capacity development delivery strategies. For instance, Tait and Williamson (2019) demonstrate that capacity development interventions with the same delivery strategy (i.e., training) can have different focuses ranging from teaching the application of KMb theories to expanding KMb networks.

One of the main approaches reported in the included studies is conducting reviews to identify necessary KMb capacities and competencies for organizations and individuals (Edwards et al., 2019; Alvaro et al., 2010; Boyko et al., 2012; Gagliardi et al., 2014; Bornbaum et al., 2015). In the included records, 18 literature reviews were present in our study (17%) and were among the identified processes for linking KMb challenges with necessary capacities (37% of total 49). For instance, Mallidou et al. (2018) identified 19 core KMb competencies from the literature, grouped into three main categories: knowledge, skills, and attitudinal aspects. The authors were interested in KMb competencies for those in the health sector.

Another major route that studies have taken in identifying necessary capacities in connection with the identified KMb challenges is using established frameworks and models. In our review, 15 studies (30% of 49) used specific frameworks to extract KMb capacities or to design interventions based on their contextual characteristics (e.g., resources). The UK MRC

Framework for Complex Interventions (Straus et al., 2011), Diffusion of Innovations and Institutional Theory (Allen et al., 2013), Levin's model of research impact (Cooper, 2014), Embedded Scholar: Enabler, Enactor and Engagement Model (Chan et al., 2017), Capacity-Opportunity-Motivation model (Yanovitzky and Blitz, 2017), evidence-informed public health process (Dobbins et al., 2018; Dobbins et al., 2019), knowledge-to-action and behavior change theory (Moore et al., 2018; Green et al., 2012), developmental evaluation (Harper and Dickson, 2019), PARiSH KMb framework (Lachance et al., 2019), the holistic model of knowledge mobilization (Lightowler et al., 2018), SPIRIT Action Framework (Williamson et al., 2019), active implementation frameworks (Wolfe et al., 2019), knowledge boundaries, organizational learning, and absorptive capacity (Oborn et al., 2013) were among the cited frameworks.

Initiatives also directly engage with their beneficiaries in capacity development planning to assess their needs, preferences and goals to identify needed capacities accordingly. In our review, these engagements took different forms, and we identified 18 instances of them (37% of 49). For instance, several studies describe involving the beneficiaries of capacity development initiatives in priority setting and needs assessment to increase the relevance of the interventions (Gerrish, 2010; Straus et al., 2011; Wahabi and Al-Ansary, 2011; Wilson et al., 2011; Holmes et al., 2012; Thomson et al., 2019; Gagliardi et al., 2015). These engagements and assessments were in the form of doing environmental scans (Holmes et al., 2012), directly assessing researchers or knowledge users' KMb needs (Peirson et al., 2012; Allen et al., 2013; Waqa et al., 2013; Barratt and Fulop, 2016; Thomson et al., 2019), interviews with management and responsible staff (Wilson et al., 2011; Ellen et al., 2013; Fairbrother et al., 2016), participatory program designs (Bennett et al., 2016; Eames et al., 2018), Appreciative Inquiry (Hung et al., 2018), learning by doing (Keita et al., 2017), and integrated KMb (Park et al., 2018).

How is capacity development being delivered? The final stage of capacity development that emerged as a theme relates to delivery strategies, which were reported in 58% of documents (61 of 105). Delivery strategies refer to the actual interventions (e.g., a workshop) and the specific goals they pursue (e.g., educating) to create the KMb support structures or enhance KMb skills. In the process of capacity development for KMb, after understanding the audience's challenges and identifying the necessary capacities for doing and supporting KMb, the literature often describes these strategies. This description often explains why a particular strategy (e.g., organizing a workshop) has been chosen to deliver capacity development, what measures are taken to ensure its relevance to its beneficiaries, and the experience of, or challenges in adopting this strategy. For instance, Gagliardi et al. (2015) demonstrated that users would need flexibility, ongoing access and tailored support in mentorship as a strategy for capacity development.

We identified three broad goals for capacity development that were articulated in the delivery strategies: (a) providing educational and skills-development opportunities (43% of 61 documents), (b) facilitating relationships and access to other stakeholders (40% of 61 documents), and (c) increasing the beneficiaries' self-reliance in doing KMb (17% of 61 documents). However, these three categories are not mutually exclusive as many share overlapping goals, and many initiatives might utilize multiple strategies concurrently.

Capacity development initiatives documented in our review employed educational and skills-development strategies to provide their participants with better KMb-relevant skills, knowledge, competencies, and attitudes. Educational initiatives include providing KMb training programs (Przybycien et al., 2011; Bhogal et al., 2011; Holmes et al., 2012; Uneke et al., 2015a; Masood et al., 2018; Ho et al., 2011; Ginossar et al., 2018; Moore et al., 2018; Park et al., 2018; Jessani et al., 2019) or organizing smaller educational events such as workshops (Briggs et al., 2010; Wahabi and Al-Ansary, 2011; Ho et al., 2011; Allen et al., 2013; Waqa et al., 2013; Uneke et al., 2017a; Uneke et al., 2018b). Other educational initiatives include mentorship or peer-support opportunities (e.g., KMb champion and role modeling) (Straus et al., 2011; Brownson et al., 2017; Ho et al., 2011; Pettman et al., 2013; Gagliardi et al., 2014; Lachance et al., 2019; Gerrish et al., 2011; Gagliardi et al., 2015). These educational interventions differ in length, targeted capacities and competencies, and participant size. Moreover, initiators often incorporate various educational concepts within the educational strategies to enhance capacity development. These concepts can include problem-based learning (Bhogal et al., 2011; Wahabi et al., 2015), cognitive learning theory and adult learning theory (Straus et al., 2011), peer teaching and self-directed learning (Wahabi and Al-Ansary, 2011), and blended and experiential learning models (Gerrish and Piercy, 2014; Harper and Dickson, 2019).

Another category of initiatives in this study is those with relational goals to improve access, networks, connections and relationships between different stakeholders. These included strategies such as building networks and increasing co-creation opportunities for organizations and individuals (Murnaghan et al., 2013; Campbell et al., 2017; Mansilla et al., 2017; Haynes et al., 2020; Green et al., 2012; Johnston et al., 2010; Hung et al., 2018), providing secondment opportunities (Gerrish, 2010; Gerrish and Piercy, 2014; Jenkins and Anstey, 2017; Kislov et al., 2018; Uneke et al., 2018b; Uneke et al., 2018a; Hope, 2016), creating communities of practice (Bazyk et al., 2015; Masood et al., 2018; Hurtubise et al., 2016; Wolfe et al., 2019), organizing joint events (Laing and Wallis, 2016; Mulvale et al., 2017; Reed et al., 2014), establishing advisory committees (Uneke et al., 2015b; Keita et al., 2017), and establishing KMb platforms and forums (Edwards et al., 2019; Haynes et al., 2020; Ongolo-Zogo et al., 2018).

The last category of capacity development strategies we identified aims to provide researchers or knowledge users with more self-reliance in doing KMb. Specifically, these initiatives often focus on enhancing the accessibility of KMb support to participants as a basis for their selection and design. Examples of these initiatives include creating guidelines for partnering with non-academic partners, templates for writing simple language summaries, and checklists and assessment criteria for assessing the quality of engaged research proposals (Holmes et al., 2012; Yost et al., 2014; Makkar et al., 2016; Uneke et al., 2017c; Hunter et al., 2019; Lachance et al., 2019; Leeman et al., 2017; Barwick, 2016; Stamatakis et al., 2017). Yost et al. (2014) argue that these tools facilitate the KMb process, provide accessibility, and increase users' confidence. Thomson et al. (2019) also highlight the need for accessibility and increasing reach in offering capacity development and demonstrated that accessibility could be increased by using different formats (e.g., webinars) instead of traditional in-person events (e.g., workshops).

Discussion

This scoping review provides a landscape of the literature on capacity development for KMb and highlights some of its important theoretical and practice gaps. This review has shown that capacity development for KMb has a multidimensional scope in terms of actors involved (in terms of both initiators and beneficiaries), intervention levels, and intervention types and

characteristics (such as accessibility and relevancy). While there is a wide range of literature on capacity development in relation to KMb, the following section reviews the insights and gaps in knowledge and practice that emerge from the review. We focus on five key themes.

Organizations as both catalysts and sites for capacity development. Literature on KMb has emphasized the role of organizational support and incentives and has demonstrated that the lack of engagement in KMb among knowledge producers or users is mainly a function of organizational support (Cooper et al., 2018; Golhasany et al., 2020; Gopaul et al., 2016; Zuiker et al., 2019). For instance, receiving effective support from research organizations to engage in KMb remains an entrenched challenge for academic researchers, as previous studies have highlighted for several years (Sá et al., 2011; Cooper et al., 2018). However, our study also shows that despite the evidence about the importance of organizational support for KMb, most capacity development initiatives target individual-level capacity development. 46% of documents included in this review targeted individual-level capacity development, while 26% of documents were related to the organizational level. Particularly significant is the finding that only 6% of documents in our review focused on knowledge-producer organizations.

This tendency to focus on the individual is also reflected in delivery strategies for capacity development. Our review classified delivery strategies into educational, relational, and self-reliance categories. Consistent with other studies, our review showed that delivery strategies with educational goals were the most common capacity development for KMb (43% in the present study) (Mallidou et al., 2018; Murunga et al., 2020; Oborn et al., 2013). Furthermore, more evidence is necessary on delivery strategies with dedicated goals for organizational capacities such as hiring knowledge mobilizers (Bornbaum et al., 2015; Glegg and Hoens, 2016; Dobbins et al., 2018; Smits et al., 2018). This mismatch between actual capacity development practices and what the evidence suggests are the most needed supports may be due to the resources needed for capacity development at the organizational level. Literature suggests that capacity development at this level requires a suite of multi-level and multi-faceted interventions to bring any practical and impactful changes, and this might be unaffordable or unviable for some capacity development initiatives (Williamson et al., 2019; Zuiker et al., 2019; Murunga et al., 2020; Gray et al., 2013; Kislov et al., 2014). Thus, a key task for research organizations, including universities, will be to understand how their organizational incentives and practices might need to evolve in order to strengthen and sustain KMb.

Relational dimensions of KMb are critical but understudied. The second insight is about the relational goals in strategies for KMb capacity development. Beyond offering opportunities for co-learning and developing trust among partners (Straus et al., 2011), relational strategies can be impactful in building the capacities for KMb by helping to produce more relevant research outputs and educating participants to engage in KMb activities (Gerrish, 2010; Dilkes et al., 2011; Boyko et al., 2012; Allen et al., 2013; Murnaghan et al., 2013; Restrepo et al., 2014; McCay et al., 2015; Mansilla et al., 2017; Mulvale et al., 2017; Hung et al., 2018; Dannevig et al., 2019; O'Brien et al., 2019). For instance, Edelstein (2016); Haynes et al. (2020); Hope (2016); Cooper et al. (2017) found that research partnerships with community partners build capacity for research use by giving more access to data, providing professional development opportunities, and creating more outputs for knowledge users, making KMb 'built-in' to research projects, and inducing more systemic changes. We refrain from using the term "effective" to assess the contribution of relational strategies due to the limited available evidence about the effectiveness of relational versus educational strategies to capacity development for KMb. Furthermore, a remarkably wide range of activities found in the literature can be considered relational, from research engagement with knowledge users to research done by clinicians and practitioners with scientific advisors. This diversity of activities, paired with limited evidence on effectiveness, presents an opportunity for considerable future research and learning.

Diversifying the evidence base on capacity building for KMb. The third insight emerging from this study is about the geographical representation of capacity development initiatives documented in the literature, which are highly skewed toward western developed countries (more than 80%). It is important to consider that the sociopolitical contexts (e.g., access to policymakers) between developed and developing countries are very different. Therefore, consistent with past literature (Jessani et al., 2016; Murunga et al., 2020), we voice our concerns about the transferability of this body of evidence to low and middle-income countries as capacity development is highly context-dependent. Further investment into research and programming on capacity development for KMb in under-served regions, particularly in the global South, seems highly appropriate, and attention should be given to documenting both processes and their results.

Documenting capacity development processes in KMb. Our review also identified a significant evidence gap in this literature on the process aspects of capacity development, particularly when compared to the evidence available on outcomes. While outcomes represent the skills, structures, and attitudes that initiators seek to develop in individuals and organizations, the process aspect relates to the design and delivery of capacity development initiatives. Kislov et al. (2014) highlighted a similar distinction between content and strategic thinking in capacity development. This gap challenges capacity development with insufficient and sometimes inconsistent evidence and practices, and limited guidance about the optimal ways of assessing and linking the beneficiaries' needs to the necessary capacities and delivery strategies. Moreover, we found limited evidence available on how individual and organizational values, available resources, or the use of established KMb theories shape capacity-building design or implementation (Mulvale et al., 2017; Murunga et al., 2020). Despite a wide recognition that the contextualization and tailoring of initiatives is a key to the success and effectiveness of initiatives (Fairbrother et al., 2016; Lachance et al., 2019), our review found limited evidence on processes for doing so. Leeman et al. (2017) highlight this shortcoming in the literature and argue that the "one-size-fits-all" approach would limit the effectiveness of capacity development in different contexts.

To contribute to building more evidence on the process aspects of capacity development for KMb literature, we suggest the following two areas for action. The first is providing greater specificity and consistency in reporting on initiatives related to capacity development. We suggest the following seven specifications that would strengthen the evidence base linking capacity development processes to their outcomes: (1) specific audience profile and their KMb challenge, (2) profile of the capacity development initiator, (3) the level and scope of intended change (i.e., individual or organizational), (4) how the targeted capacity/capacities have been identified, (5) how the delivery strategy was chosen and executed, (6) what outcome and process indicators were used, and (7) key contextual variables such as assumptions, values and resources. Second, scholars and practitioners might draw on evidence from other fields (e.g., management studies) for

guidance (Oborn et al., 2013). As an instance of such reference, in our review, studies such as Bennett et al. (2016); Holmes et al. (2014); Eames et al. (2018) draw guidance from the Potter and Brough (2004) model of capacity development. The Potter and Brough (2004) model allows linking different aspects of capacity development, like the role of individuals and organizations, to create a more systemic approach to capacity development in different contexts. Their model incorporates a hierarchy of needs in capacity development that correspond to a series of interconnected levels (Potter and Brough, 2004).

Limited evidence on the evaluation of capacity development for KMb. A final gap that our paper identifies relates to theoretical evidence and practical clarity on using evaluative practices for capacity development for KMb. In the literature reviewed for this study, assessing current capacity, establishing a baseline before the commencement of capacity development, and measuring changes in skills and supports was not common practice. This lack of assessment limits our understanding of the effectiveness of different capacity development approaches and delivery strategies (Gray et al., 2013). This gap might be because evaluation and assessment are time and resource-intensive (Stamatakis et al. 2017). However, our review suggests that another potential challenge to using evaluations might be due to differing interpretations of what evaluation is and what it should cover in capacity development initiatives and studies.

In some initiatives, evaluation can mean planning and delivering initiatives that are deemed user-friendly based on the feedback of intended participants (Ginossar et al., 2018; Haynes et al., 2020). For instance, capacity development initiatives report whether their interventions were "well-received" (Tait and Williamson, 2019), and participant feedback (through surveys and interviews) assesses whether initiatives were accessible, relevant, and interesting in terms of quantity and quality (Park et al., 2018). The literature on KMb capacity development can also portray evaluations and assessments as a mechanism to advance and establish KMb learning and achievement of individuals and organizations (Murunga et al., 2020; Scarlett et al., 2020; Bornbaum et al., 2015). For instance, Donnelly et al. (2014, p.53) point out that "conceptualizing evaluation as a change process and an approach to measure change opens the door for evaluation to be considered a mechanism of IKT [integrated knowledge transfer]". Usually, in this sense, studies measure and compare the skills, attitudes and structures for doing and supporting KMb before and after the interventions.

Finally, the literature sometimes defines evaluation as capacity development's contribution to increasing research uptake and informing policies and practices (Kreindler, 2018; Tate et al., 2019). For instance, Thomson et al. (2019) listed changes in patient care outcomes, such as hospital stays, as a contribution of their KMb capacity development initiative. Even though all of these interpretations of capacity development evaluation are informative, we need better guidance on using different approaches under various contexts to save more resources and maximize learning.

Limitations

Our study intentionally sought to review a vast scope of the available literature on capacity development for KMb. However, the large volume and scope of the gathered documents and their varied goals and designs presented some limitations. First and foremost, given the cutoff date used for collecting records, data and documents after June 2020 have not been included in the analysis. This may miss the most recent developments in the field. Furthermore, our study used inductive analysis to identify emerging themes, which proved to be challenging for data classification, particularly given the broad range of materials we were analyzing. This meant that there was a level of subjective interpretation that needed to be applied in analyzing and classifying records. The high-level representation of studies from predominantly health-related fields may be another limitation to generalizing understanding from this study to other contexts and fields. This suggests a need for more published evidence from other fields.

A final notable limitation related to the scoping review method adopted for this study was that we could undertake citation tracing of references in the included documents to gain more insights. Even though these limitations do not undermine the objectives and the nature of this study, they might have impacted the understanding gained from reviewing the literature.

Conclusion

The findings from this scoping review provide a broad picture of the processes, concepts, and complexities of capacity development for KMb. It demonstrated that most capacity development for KMb initiatives focus on individuals and providing educational opportunities. However, as the role of organizational supports and capacities is emphasized in literature to overcome the challenges of doing KMb, we believe further research on capacity development for KMb on organizational levels is warranted. Equally important, our study argues that the process aspect of capacity development for KMb is much less researched and discussed than the outcomes side. This is a significant gap in the literature that potentially affects the effectiveness of capacity development initiatives. Future research, including experimental studies that are less common in this literature, is needed to address this gap.

Data availability

The datasets generated during the current study are available from the corresponding author upon request. These include Excel files of the first and second levels of screening. The protocol of the study (Supplementary Table S1) and Supplementary Table S2 are submitted to the journal as appendices of the study.

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Additional information

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