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**Article**

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Regular article

## Innovation capability in SMEs: A systematic review of the literature

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## ABSTRACT

Despite the profusion of innovation reviews, there is lack of reviews of innovation capability in small business context. There is a need to define the construct from a practical point of view by utilizing existing innovation research. Thus, this study aims to enhance the understanding about the characteristics of innovation capability in small business context by reviewing the empirical literature. This paper presents the results of a systematic review on the innovation capability in small businesses. As the main contribution, the paper identifies a holistic view of the evolving research on innovation capability in small businesses. Thus, the paper draws a picture of the topics investigated in the literature, and provides an understanding about the different communities of innovation capability research. There are no prior systematic literature reviews on innovation capability in small businesses. The results enhance understanding about the special characteristics of innovation capability in small business context. The presented characterization of innovation capability can guide further studies by offering precepts for how innovation capability can be comprehended among small businesses. Further, using the findings of this review, managers can improve their firms' capability to innovate by acknowledging the multiple facets of innovation capability.

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## Introduction

Firms of all industries are nowadays developing innovation to guarantee their success in the markets. Academic discussion around this phenomenon has concentrated on the concept of innovation capability (Calantone, Cavusgil, & Zhao, 2002; Lawson & Samson, 2001; Lin, 2007; Romijn & Albaladejo, 2002). Innovation capability can be conceptualized as the potential to create novel and valuable products or knowledge (Zheng, Liu, & George, 2010). Lawson and Samson (2001) determine innovation capability as “the ability to continuously transform knowledge and ideas into new products, processes and systems for the benefit of the firm and its stakeholders”. Thereby, innovation capability is central to small businesses aiming to compete with their larger and more resource possessing competitors. Empirical evidence on the innovation capability in small business context has elaborated into two paths of research: the one studying the determinants of innovation capability, and the one studying the consequences on innovation capability. Thus, small business innovation has been considered either as a process or as an outcome.

Previous studies have reviewed these both areas of innovation capability literature. For example, Wolfe (1994) reviewed research on organizational innovation, whereas Ali (1994) divided

the review on incremental and radical innovation and presented several factors that affect product development decisions. Garcia and Calantone (2002) clarified the innovativeness terminology and technological innovation typology by conducting a review of the literature from the engineering, marketing, and new product development. Adams, Bessant, and Phelps (2006) focused their review on innovation management measurement with the aim of constructing a framework that can be used to assess firm level innovation activity. Crossan and Apyadin (2010) took a more general approach in their review by concluding with a multi-dimensional framework of organizational innovation that links leadership, innovation as a process, and innovation as an outcome. In addition, West and Bogers (2014) concentrated on specific innovation type, open innovation.

Despite the profusion of innovation reviews, there are no reviews of innovation capability in small business context. There is a need for such review, as innovation capability has been found to be a multi-faceted construct and differs among small and large firms (Forsman, 2011; Saunila & Ukko, 2014). The prior classifications of innovation capability typically consider a specific form of innovation, for example process or product innovation, in place of comprehensive innovation capability. Some studies classify innovation capability either radical or incremental. Other studies have focused on evaluating the firm's capability to innovate by determining the capabilities that overall innovation capacity includes. Therefore, there is a need to define the construct of

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innovation capability from a practical point of view by utilizing existing innovation research.

Thus, this study aims to enhance the understanding about the characteristics of innovation capability in small business context. This is done with a systematic review of the empirical research. First, the study contributes to the literature by showing the conditions under which small firms are likely to pursue high innovation capability. Second, the study contributes to the literature by advancing current understanding on how innovation capability is associated with performance outcomes at firm level. The paper is structured as follows: section “Research approach” presents the research approach used for the study. Section “Findings” presents the main results. Finally, conclusions, limitations, and potential future developments are presented in section “Conclusions”.

## Research approach

The paper presents the results of a systematic review of innovation capability literature on the small business context. A process of Bakker (2010) was selected as a basis of the review as the procedure is repeatable and offers a transparent process the selection of the relevant studies. The included articles were delimited to English-written peer-reviewed articles with empirical evidence. This type of articles were supposed to offer the most appropriate coverage for the issue under consideration. The process of selecting suitable studies included several steps, each step of which was to either include or eliminate articles in compliance with predetermined criteria (Fig. 1). The inclusion and exclusion criteria are presented in Appendix A.

The first phase included the initial search. In this phase, selection of the papers was based on searching for relevant journal articles from Scopus database. The use of Scopus limited the number of analyzed articles, as the review was targeted to leading peer reviewed journals. The number of publications is significantly larger in other databases such as Google Scholar, but it also contains all kinds of publications including working papers, conference papers, and student assignments, which wanted to exclude from the search. Search was performed by the following keywords: “innovation capability\*”, “innovation potenti\*”, “innovation abili\*”, or “innovation capacit\*” browsing title, and “sme”, “small busines\*”, “small compan\*”, “small enterp\*”, “small fir\*”, or “small and mediu\*” browsing title,

abstract and keywords. Different versions of the search terms were accepted by using an asterisk in the search field. A total of 122 related articles were found.

In the second phase, articles were excluded if they did not belong to the subject area “Business, Management and Accounting”. The aim of the review was to achieve high managerial relevance and articles that belong to that subject area were assumed to meet that criterion. Also, only articles and articles in press were included. This phase delimited the number of articles to 59.

In the third phase, articles were excluded based on the title. Remaining articles were gone through title-by-title and the ones that did not meet the predefined criteria were excluded. This phase decreased the number of articles to 55.

The fourth phase included the abstract check. Abstracts of all the remaining articles were read and unsuitable articles were eliminated from the list of relevant articles. At the end of this phase, the number of articles was reduced to 53.

In the fifth phase, articles were excluded based on the full text. This phase finally ensured that all the articles met the predefined inclusion and exclusion criteria. Thus, the final number of relevant articles was 39.

## Findings

### Descriptive findings

#### General findings

Fig. 2 shows an increase in the number of journal articles over time. The division of the reviewed articles per publication year shows that 2013, 2017, and 2018 were outstanding dates for research on innovation capability among small businesses. Beginning with a very finite number of articles per year for the period 2001–2012, the number of published articles on innovation capability in small business context increased since 2013. With the exception of year 2015, when only one article was published.

Fig. 3 shows the most popular journals for small business innovation capability research. The results show that Research Policy, Journal of Small Business Management, and Creativity and Innovation Management are the most central journals in this field. Also, Management Research Review, International Journal of Technology Management, International Journal of Innovation Science,

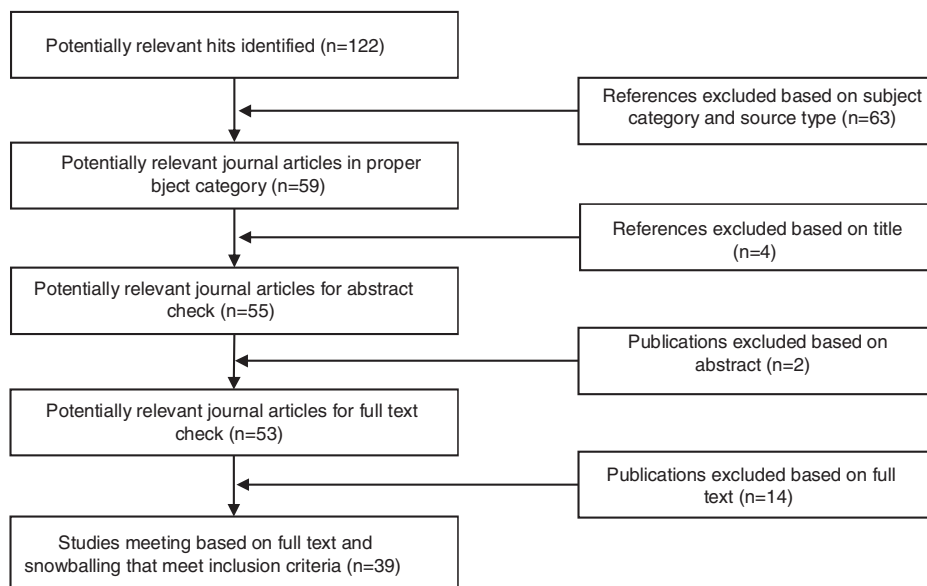


Fig. 1. Literature selection process.

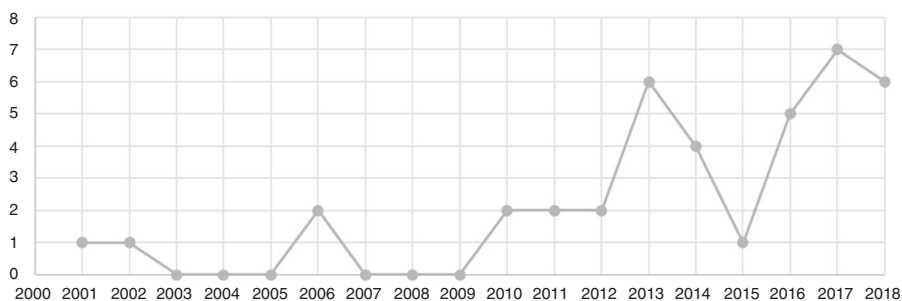


Fig. 2. Number of papers published over time.

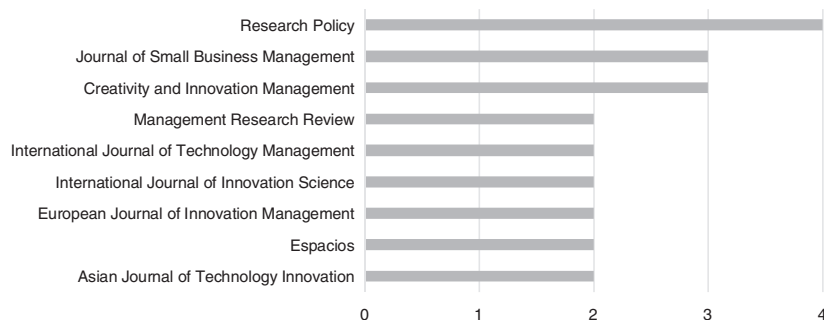


Fig. 3. Most important journals.

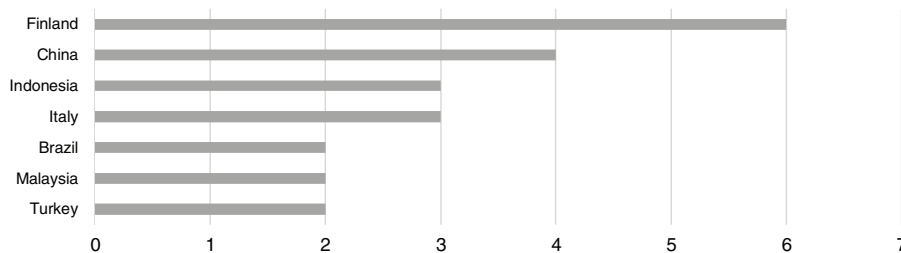


Fig. 4. Most important countries based on the main author.

European Journal of Innovation Management, Espacios, and Asian Journal of Technology Innovation have published more than one article about innovation capability in small business context in the studied period. Thus, such journals are recognized as a platform for sharing knowledge between different approaches.

Fig. 4 shows the distribution of the small business innovation capability research according to country from which the empirical evidence is collected. Overall, Finland, China, Indonesia, and Italy are the countries with most conducted empirical studies. Also, Brazil, Malaysia, and Turkey seem to have a strong tradition to study the topics related with innovation capability among small businesses.

The division of the articles of the reviewed articles indicates that innovation capability research in small business context is split into several areas (Fig. 5). General Business, Management and Accounting, Strategy and Management, and Business and International Management were the disciplines where this phenomenon was most often investigated. In addition, Management of Technology and Innovation discipline have produced many studies. Fig. 6 presents the trends of innovation capability research. Three same disciplines (General Business, Management and Accounting, Business and International Management, and Management of Technology and Innovation) were the disciplines that have grown the most over time. With the exception of Strategy and Management

discipline as the number of studies have remarkably decreased since 2015.

#### *Innovation capability classifications*

The two conceptualizations of innovation capability, innovation as a process and innovation as an outcome, are well established also in small business context. In the first line of research that considers innovation as a process, a common way to conceptualize innovation capability is to think about it as the potential to create innovative outputs (Dadfar, Dahlggaard, Brege, & Alamirhoor, 2013; Keskin, 2006; Neely, Filippini, Forza, Vinelli, & Hii, 2001). In these studies, innovation capability is considered as one-dimensional phenomenon including the actions that could be implemented to enhance the performance of SMEs (Castela, Ferreira, Ferreira, & Marques, 2018). Widely used definition is the one of presented by Lawson and Samson (2001). They conceptualize innovation capability as “the ability to continuously transform knowledge and ideas into new products, processes and systems for the benefit of the firm and its stakeholders”. Similarly, Keskin (2006) consider that innovation capability is comprised by the readiness to test new ideas, to track down novel manners to do things, and to possess creativity in the ways of operation. Also, Zhang and Hartley (2018) state that innovation capability focuses on the utilization of experience and ideas from distinct origins.

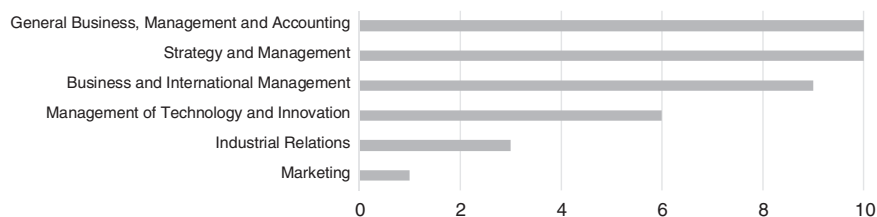


Fig. 5. Number of papers published based on disciplines.

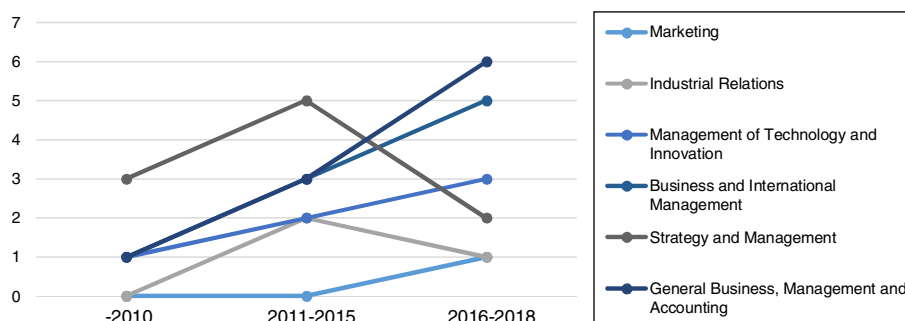


Fig. 6. The trends of innovation capability research in small business context.

Another stream also defines innovation capability as the potential to create innovative outputs, but defines multiple dimensions that together contribute to high innovation capability (Boly, Morel, & Camargo, 2014; Saunila, 2017; Saunila & Ukko, 2014). These include for example leadership, organizational culture, external knowledge utilization, competence management, and creativity of employees. Some studies define different kinds of capabilities that the total innovation capability consists of (Forsman, 2011; Oura, Zilber, & Lopes, 2016). These include for example learning capabilities, entrepreneurial capabilities, marketing capabilities, networking capabilities, and resource exploitation capabilities. In small business context, there are also single studies that divide innovation capabilities either as sensing, seizing, and transforming capabilities (Fitz-Koch & Nordqvist, 2017), or assimilation, acquisition, deployment, and transformation capabilities (Branzei & Vertinsky, 2006).

The second line of research considers innovation as an outcome. This line of research has defined innovation capability as the capacity to produce distinct types of innovation, such as product innovation, process innovation, or organizational innovation. Product innovation is the most studied individual type of innovation (Çakar & Ertürk, 2010; Landoni et al., 2016; Nassimbeni, 2001; O'Cass & Sok, 2014; Romijn & Albaladejo, 2002), but process innovation is significantly less studied (Hervas-Oliver, Boronat-Moll, & Sempere-Ripoll, 2016). Product innovation capability and process innovation capability are also studied together (Mejía Vallejo & Arias-Pérez, 2017). In addition, large number of studies consider all commonly recognized innovation types, meaning innovation in products, processes, organization and marketing, together (Bruhn, Alcântara, & Calegário, 2016; De Martino & Magnotti, 2018; Ilori, Lawal, & Simeon-Oke, 2017; Kafetzopoulos & Psomas, 2015; Maldonado-Guzmán, Garza-Reyes, Pinzón-Castro, & Kumar, 2018). In small business context, only single studies divide innovation types as explorative and exploitative (Kittilaksanawong & Ren, 2013), or radical and incremental (Wang, Lu, Zhao, Gong, & Li, 2013).

#### The importance of context

While some studies demonstrated that there are no massive divergences between the innovation capability of service and manufacturing industries (Forsman, 2011; Saunila & Ukko, 2014), the

review resulted that small businesses are not the unanimous group of firms. Small firms have put more emphasis on leadership that supports innovation capability (Saunila & Ukko, 2014). On the other hand, Bruhn et al. (2016) found the evidence of the resource restrictions of small firms as export firms with more than 70 employees are more probable in adopting organizational and strategic innovation.

The focus of the majority of studies was small businesses in general (Castela et al., 2018; Dadfar et al., 2013; Hervas-Oliver et al., 2016; Saunila, 2017). However, there were many studies that concentrated especially on the manufacturing sector (Kafetzopoulos & Psomas, 2015; Kim, Park, & Paik, 2018; Nassimbeni, 2001; Zhang & Hartley, 2018). Single studies focused on specific industry or firm type, such as electronics and software firms (Romijn & Albaladejo, 2002), food firms (De Martino & Magnotti, 2018) or family firms (Fitz-Koch & Nordqvist, 2017).

#### Contribution to/of innovation capability

##### Determinants of innovation capability

Based on the review, the level of innovation capability is determined by multiple aspects. These determinants include top management leadership (Kim et al., 2018), knowledge development (Branzei & Vertinsky, 2006; Saunila & Ukko, 2014), entrepreneurial orientation (Mohd Noor et al., 2017), and external networks (Jørgensen & Ulhøi, 2010; Kim et al., 2018; Liu, Shou, & Xie, 2013). Considering external networks, Liu et al. (2013) suggest that intermediary organizations can further the innovation resources obtainable for small businesses, whereas Jørgensen and Ulhøi (2010) state that especially relations established within the earliest phases of the firm's lifecycle are crucial in innovation capability development. In turn, organizational rigidity and insufficient resources can hamper innovation capability (Kim et al., 2018).

There are also studies considering the determinants of commonly recognized innovation types, meaning innovation in products, processes, and organization. What it comes to product innovation capability, both internal sources (e.g., prior work experience, education) and external sources (e.g., suppliers, customers) facilitate innovation capability (Romijn & Albaladejo, 2002). Also technological intensity was found to be associated to product

innovation (Bruhn et al., 2016). In turn, uncertainty avoidance has negative influence on product innovation capability (Çakar & Ertürk, 2010). Valaei, Rezaei, and Emami (2016) found that both product and process innovation capability are positively affected by exploitative learning strategy. Bruhn et al. (2016) show that organizational innovation is associated with external links.

Further, Kittilaksanawong and Ren (2013) conclude that collaboration with research institutes contributes to exploratory and exploitative innovation capabilities. Wang et al. (2013) found that organizational unlearning significantly affects incremental innovation, whereas organizational unlearning affects radical innovation indirectly via organizational flexibility.

#### *Innovation capability and performance dimensions*

The majority of the studies found a positive relation between innovation capability and firm performance in the context of small businesses (e.g., O’Cass & Sok, 2014; Oura et al., 2016; Zhang & Hartley, 2018). Based on the review, innovation capability is connected to new product performance (Zhang & Hartley, 2018), brand performance (Odoom & Mensah, 2018), and overall firm performance (Dadfar et al., 2013; Keskin, 2006). Dadfar et al. (2013) concluded that the preconditions for this relation are for example effective organizational structure, learning, processes and relationships with the suppliers, customers, and other networks.

Also, the individual determinants of innovation capability are proven to be effective in firm performance. Oura et al. (2016) found that innovation capacity (consisting of multiple interrelated capabilities) impacts export performance that is formed by financial, strategic, and satisfaction-related aspects. The results of Saunila (2017) demonstrate that three dimensions of innovation capability, named as participatory leadership culture, know-how development, and ideation and organizing structures, are connected to firm performance.

Different innovation types also contribute to firm performance. Product innovation capability is connected to export performance (Nassimbeni, 2001), growth (O’Cass & Sok, 2014), and overall competitive advantage (Landoni et al., 2016). However, O’Cass and Sok (2014) state that product innovation capability must be accompanied by a high level intellectual resources. The results of Landoni et al. (2016) are applicable to specific design innovation capabilities which they consider effective even in the short term.

Further, multiple types of innovation capability, meaning innovation in products, processes, organization, and marketing, contribute to operational performance (Kafetzopoulos & Psomas, 2015), and business return (Maldonado-Guzmán et al., 2018). The results of Kafetzopoulos and Psomas (2015) did not reveal a direct influence of these types of innovation capability on financial performance, but the relationship is facilitated by operational performance. On the contrary of other studies, Mejía Vallejo and Arias-Pérez (2017) found that the product and process innovation capability does not ensure sales growth or market share.

## **Conclusions**

### *Implications for research and practice*

This systematic review has highlighted four main themes of innovation capability in small business context. First, empirical evidence shows that innovation capability, conceptualized either as a process or as an outcome, affects firm performance. Second, in

small business context, innovation capability is most often conceptualized as an outcome. Third, survey designs dominate the field, whereas only a few studies adopted qualitative design. Fourth, innovation capability is often studied in small businesses in general or in the manufacturing sector.

Thus, this study contributes to the research on the determinants of innovation capability (e.g., Branzei & Vertinsky, 2006; Jørgensen & Ulhøi, 2010; Kim et al., 2018; Saunila & Ukko, 2014), and the consequences on innovation capability (e.g., O’Cass & Sok, 2014; Oura et al., 2016; Zhang & Hartley, 2018). Considering the findings of this study, it is evident that conscious organizational actions related to developing innovative outputs provide grounds for firms to sustained competitive advantage. Further, the two conceptualizations of innovation capability, innovation as a process and innovation as an outcome, are well established also in small business context.

For practitioners, the findings reveal that small businesses can utilize many different forms of innovation capabilities. Some firms rely on their abilities to generate product innovation, while others establish multiple actions that together contribute to innovation capability. Further, firm performance can be affected by paying attention to innovation capability. However, there is not a common receipt for the successful utilization of innovation capability. Rather, managers should find the right dimensions of innovation capability based on their particular business needs.

### *Limitations*

The main limitation of this study considers the methodology. The initial search was made through Scopus database and other search engines may have produced slightly different results. Keywords were selected to cover the phenomenon as fully as possible, but it still possible that relevant articles were missed. In addition, inclusion and exclusion criteria were made as clear as possible but it is possible that relevant articles were missed as the decision was made with the researcher’s personal judgment.

### *Future research directions*

This systematic review offers many avenues for future research. First, the majority of reviewed empirical studies rely on quantitative and survey designs. Qualitative research designs or case studies would provide missing input on how innovation capabilities are actually understood and implemented among small businesses. Case studies could also bring clarity to the role of different contextual factors, as they are central in the development of innovation capability among small businesses. As many studies focused on small businesses in general or manufacturing sector, there is a need of studied focusing more closely on the service sector.

Second future research possibility could be to study whether firm performance is associated with specific types of innovation capability, such as process, organizational or marketing innovation capability. Product innovation was the most studied type of innovation capability, but other types require further research. In addition, there were only a few studies (considering the relation between innovation capability and performance) that defined innovation capability into radical and incremental or explorative and exploitative. Thus, there is a research gap that requires further research.

Finally, product innovation studies dominated the research. Future studies could offer more evidence on other types of capabilities that small businesses should concentrate on.

## Appendix A. Inclusion and exclusion criteria

Inclusion criteria	Reason
Articles with empirical evidence	Provides empirical results about innovation capability among small businesses
Articles in peer-reviewed journals	Ensures the quality of the reviewed articles
Articles in English	Assists the replicability of the review
Articles in the subject category "Business, management and accounting"	Enhances the possibilities of practical contribution
Exclusion criteria	Reason
Other than firm level innovation capability (national or individual innovation capability)	Do not offer firm-level contribution
Project level performance	Do not offer firm-level contribution
Articles with theoretical/conceptual design	Do not offer empirical evidence

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<sup>1</sup> \* indicates a source that was included in the systematic review.