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Knowledge hiding and knowledge hoarding: A systematic literature review

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The present study aims to present a consolidated view of the quantitative research on Knowledge Hiding (KHi) and Knowledge Hoarding (Kho), and the relationship with Knowledge Sharing (KS), and propose guidelines for future research. A systematic literature review was adopted, following rigorous procedures. The articles were searched in Scopus, Web of Science, Wiley Online, Science Direct, and Emerald. Fifty different articles were analyzed. The oldest article identified is from 2011. They were published in 33 different journals. Only 16 authors published more than one article on the topic. The four behaviors can be perceived as positive when the individual is committed to the organization and negative when the individual is not committed to the organization. A framework that summarizes the suggestions for future research is presented. Understanding the relationships between KHi and KSc, and between Kho and KSd might facilitate the flow of knowledge in organizations. The paper provides an original contribution by considering KS as two processes, collection and donation, highlighting the oppositional relationship between KHi and KSc, and between KHo and KSd. Furthermore, research gaps and further research lines in the KHi, KHo, and KS area are highlighted.

1 | INTRODUCTION

Knowledge is an important intangible asset in both the private and public sectors (Ahbabi, Singh, Balasubramanian, & Gaur, 2019; Hao, Yang, & Shi, 2019; Marques, Falce, Marques, Muylder, & Silva, 2019; Massaro, Handley, Bagnoli, & Dumay, 2016). In the private sector, knowledge is considered essential for achieving sustainable competitive advantage (Sumbal, Tsui, Cheong, & See-to, 2018; Zhang & Min, 2019), which means its management is associated with organizational survival. Knowledge Management (KM) is "a collection of processes that govern the creation, dissemination and use of knowledge to achieve organizational goals" (Lee & Yang, 2000, p. 784). Knowledge Sharing (KS) is considered the key process within organizations (Naim & Lenkla, 2016), as it helps reduce rework and increases innovation, as well as helping to retain knowledge in the organization when an employee leaves the company (Xue, Bradley, & Liang, 2011).

Knowledge Sharing is "the process whereby individuals mutually exchange their knowledge and create new knowledge" (van den Hooff & Ridder, 2004, p. 118). Several studies have sought to identify the antecedents of KS in different contexts (Ghobadi, 2015; Kumi & Sabherwal, 2019; Nguyen, Nham, Froese, & Malik, 2019; Witherspoon, Bergner, Cockrell, & Stone, 2013). However, few companies have been successful in promoting knowledge sharing among their employees (Lekhawipat et al., 2018). Moreover, few studies have investigated non-KS (Evans, Hendron, & Oldroyd, 2015; Zhang & Min, 2019), when individuals intentionally hide knowledge. Knowledge withholding includes different types of counterproductive behaviors, such as Knowledge Hiding and Knowledge Hoarding (Wu, 2020).

Knowledge Sharing is not considered the opposite of hiding or hoarding knowledge (Anand & Hassan, 2019; Connelly, Zweig, Webster, & Trougakos, 2012). Knowledge Hiding (KHi) "is an attempt by an individual to retain or hide knowledge that has been requested by someone else" (Connelly et al., 2012, p. 65). While Knowledge Hoarding (KHo) is the deliberate concealment of knowledge that is relevant to another but not requested (Evans et al., 2015). Given the need for KS within organizations, Khi and Kho are two types of counterproductive behaviour that should be avoided (Evans et al., 2015).

Connelly et al. (2012) consider the antecedents of KHi and KHo may be different from those of KS. Thus, in addition to identifying the antecedents of KS, it is necessary to identify the antecedents of KHi and KHo. Gagné et al. (2019) suggest non-sharing may occur because individuals may be unaware of the needs of others, but that hiding knowledge is a way of intentionally not sharing knowledge (Butt, Ahmad, & Shah, 2020). Thus, it may be the case that some antecedents of KHi or KHo may discourage KS. Further research into KHi and KHo is needed according to Connelly et al. (2012), because there is a gap in the literature regarding the antecedents of KHi, KHo, and KS.

This research explores that gap in an attempt to identify the antecedents of KHi and KHo and their relationship with KS. The present study aims to present a consolidated view of the quantitative research on KHi and KHo, and the relationship with KS, and propose guidelines for future research. To fulfill this objective, a systematic literature review was developed, following rigorous procedures, based on Wolfswinkel, Furtmueller, and Wilderom (2013) and Webster and Watson (2002) which allows us to visualize the state of the art on the subject.

The main contributions of this study, considering the quantitative research on KHi and KHo, are, it: (1) provides a systematic overview of the antecedents of KHi and KHo; (2) analyses the scales developed and used to measure KHi and KHo; (3) analyses the relationship of the two counterproductive behaviors with KS; and (4) presents guidelines for future research. Below, this article is structured as follows: adopted methodological procedures; data and results analysis; and conclusions.

2 | RESEARCH METHOD

- This section describes the research method employed to achieve the proposed objective. In this case, a systematic literature review based on Wolfswinkel et al. (2013) and Webster and Watson (2002) was adopted. The method consists of five stages, which are conducted iteratively (Wolfswinkel et al., 2013): definition, search, selection, analysis, and presentation.

- In the definition stage, the criteria adopted to include and exclude the articles for analysis are explained, the areas of interest and research sources are identified; and the search terms are chosen. The inclusion criteria were: (1) publication until July 20, 2020, date when the search was conducted; (2) articles published in scientific journals; and (3) English language. The exclusion criteria were: (1) articles published in a language other than English; (2) articles published in conferences; and (3) books. The study was not limited to a particular research area, as the subject applies to a variety of research areas. The articles were selected from the Scopus, Web of Science, Science Direct, Emerald, and Wiley Online databases. The search words were ("knowledge hid*" and "survey") or ("knowledge hoard*" and "survey"), in the "title, abstract and keywords" option in Scopus and "topic" in the Web of Science. The keywords "KHo" or "knowledge hoard" or "knowledge hide" or "KHi" and "survey" were used in Wiley Online. In Science Direct and Emerald, the keywords were "KHo", "knowledge hoard",

"knowledge hide", "KHi" one at a time and the articles involving "survey" were selected manually. The search procedures were not the same because the article databases offer different search options. Thus, the form of the search was adjusted so that they were as similar as possible.

- In the search stage, the study was carried out according to the planning in the previous stage. The number of articles resulting from each database was: Scopus 35, Web of Science 20; Wiley Online 25; Science Direct 8; and Emerald 17. A total of 105 articles were identified, without removing duplicates.

- The selection stage involved: (1) filtering the duplicate articles; (2) refining the set of articles based on reading the title and abstract or the full article if there was any doubt about the inclusion/exclusion of the article; and (3) adding new articles discovered from the references of the selected articles. Initially, 46 articles were removed because they appeared in more than one of the databases consulted.

- After reading the titles and abstracts, a number of articles were removed for the following reasons: (a) six articles because although the authors mention the keywords, the articles only dealt with KS; (b) two articles because they were not written in English; and (c) three articles because they did not adopt a survey method (but rather theoretical, grounded theory, and qualitative methods). After reading the articles, two new articles were included in the analysis, as they were cited and not part of the initial list of selected articles. Thus, 50 articles were listed for the next stage.

- In the analysis stage, the selected articles were coded, using open, axial, and selective coding, according to Wolfswinkel et al. (2013). Initially, a form was prepared to collect the data from the articles that met the research objective, as shown in Table 1.

- Once the form had been completed with the aid of Microsoft Excel®, the descriptive items were quantified, and the texts were coded. The initial coding was open, without the prior definition of codes. Subsequently, axial coding required a new reading and permitted the organization of the codes into categories, grouping those with similar or equal meaning, and identifying relationships between them that allowed the creation of a hierarchy of categories. Finally, in the selective coding the categories were refined and integrated considering the main categories. The encoding was recorded in Microsoft Excel®. To ensure reliability, the analysis was performed twice by the same person, according to the proposal by Krippendorff (1980).

Finally, in the presentation stage, the results and interpretation were structured to be part of the article. This stage is described in Sections 3 and 4 of the present article. Figure 1 outlines the method adopted in the literature review.

3 | DATA ANALYSIS AND RESULTS

This section is organized into five parts: bibliometric findings; concepts and scales; antecedents and consequents; and future research.

3.1 | Bibliometric findings

The oldest article identified in this survey is from 2011. However, the number of articles published per year has been growing since 2015 (Figure 2). Articles published on the journal website that, as yet, have not received volume and issue numbers were understood to

TABLE 1 Data collection form

Items for collection	Result expected from the collected item
• Year of Publication, Journal, Journal Area • Author (s), Country of the Authors, Number of Authors per article	• when and where it was published (journal and area) • who are publishing (author and country) and research partnerships
• KHi (concept, scale, and author)	• Analyze the concept and how it is measured
• KHo (concept, scale, and author)	• Analyze the concept and how it is measured
• KS (concept, scale, and author)	• Analyze the concept and how it is measured
• Antecedents of KHi	• Identify the antecedents of KHi
• Antecedents of KHo	• Identify the antecedents of Kho
• Relations between KS, KHi, and KHo in the model	• Analyze the relations between the concepts
• Results of KHi	• Analyze the results of Khi
• Results of KHo	• Analyze the results of Kho
• Future research	• Analyze the guidelines for future research

have been published in 2020. It is also necessary to consider that the data collection was conducted half way through 2020. This shows the topic is recent, and that research into it is growing.
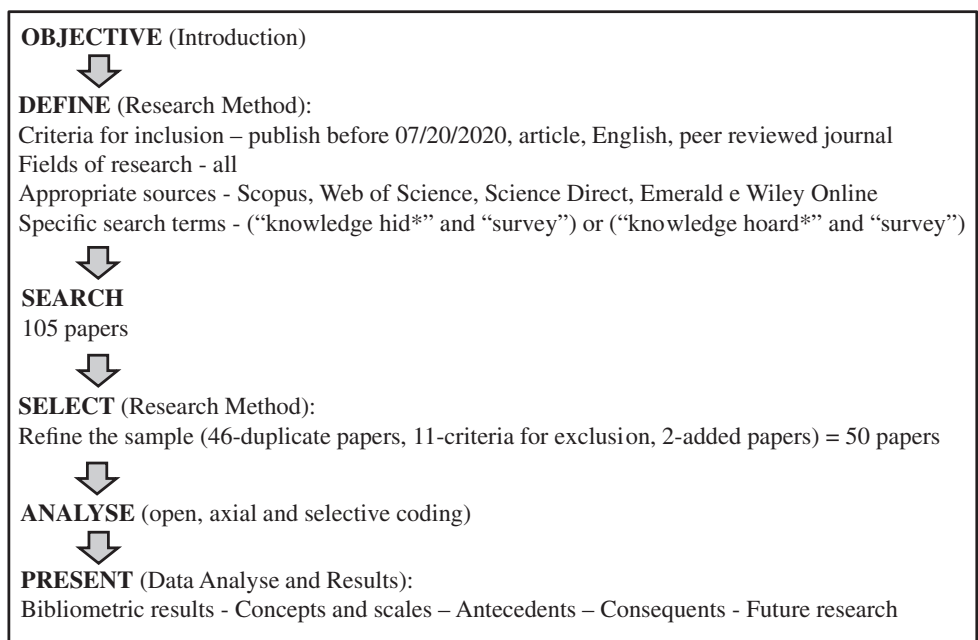
The articles were published in 33 different journals, which were classified into the areas of business and management (43 articles), psychology (15 articles), computer science (6 articles), nursing (1 article), and energy (1 article), the total number is larger than the total of articles because 16 journals are classified in more of one area (Table 2). The journal area was identified from Scimago (https://www.scimagojr.com/index.php). Only one of the journals has no JCR (Journal Citation Report) or h-index ranking, which demonstrate the quality of the journals in which the topic is being published. The unranked journal is new, being founded in 2014, which may explain its lack of indicators.

Only six journals have two or more articles on the topic. The total number of authors identified in the articles was 140, with most articles having more than one author (Table 3). Articles with two or more authors may generate more relevant contributions due to the exchange of knowledge between the authors (Curado, Oliveira, & Maçada, 2011).

Only 16 authors published more than one article on the topic. This can be explained by the fact that the number of articles on the subject is still small, and only started to grow in 2015. Table 4 presents the authors with higher number of published articles and their partners.

Most of the articles (28) have authors from institutions in the same country. Twenty two articles have authors from institutions from more than one country (2, 3 or 4 countries). International partnerships are important to the debate on the topic, especially when comparing different cultures. Viewing Table 5, one can see the subject is under study in institutions of countries located in four continents: Asia, America, Europe, and Oceania. Asian institutions are present in

OBJECTIVE (Introduction)
⬇
DEFINE (Research Method):
Criteria for inclusion – publish before 07/20/2020, article, English, peer reviewed journal
Fields of research - all
Appropriate sources - Scopus, Web of Science, Science Direct, Emerald e Wiley Online
Specific search terms - ("knowledge hid*" and "survey") or ("knowledge hoard*" and "survey")
⬇
SEARCH
105 papers
⬇
SELECT (Research Method):
Refine the sample (46-duplicate papers, 11-criteria for exclusion, 2-added papers) = 50 papers
⬇
ANALYSE (open, axial and selective coding)
⬇
PRESENT (Data Analyse and Results):
Bibliometric results - Concepts and scales – Antecedents – Consequents - Future research

FIGURE 1 Method for reviewing the literature

36 articles, Europe in 12 articles, America in 9 articles, and Oceania in 3 articles.

Authors from Chinese institutions have articles together with authors from institutions from seven other countries, four in partnership with authors from American institutions. This appears reasonable due to China's population and also because many Chinese students do part of their studies in the United States. Authors from Canadian institutions have articles with authors from institutions in six other countries, while Americans have articles with authors from institutions in seven other countries, but only one article together. Due to the proximity of the two countries (Canada and the United States), it might seem natural to expect some partnership between the institutions.

3.2 | Concepts and scales

In five articles (Al-Abbadia, Alshawabkeha, & Rummana, 2020; Su, 2020; Xia, Yan, Zhang, & Chen, 2019; Zhao, Xia, He, Sheard, & Wan, 2016; Zhu, Chen, Wang, Jin, & Wang, 2019), KHi is defined without mentioning a specific author, while they mention the same aspects identified in the definition provided by Connelly et al. (2012). Five articles (Anaza & Nowlin, 2017; Evans et al., 2015; Fang, 2017; Lee, Kim, & Hackney, 2011; Peng, 2012) do not explicitly present the concept of KHi. In the remaining 40 articles present, the concept created by Connelly et al. (2012), which considers three aspects, namely: intentionality—an act performed consciously; retention—not disseminating knowledge; and request—another individual requests the knowledge.

The concept of KHo is presented in only 13 articles (Al-Abbadia et al., 2020; Anaza & Nowlin, 2017; Connelly et al., 2012; Evans et al., 2015; Feng & Wang, 2019; Garg & Anand, 2020; Holten, Hancock, Persson, Hansen, & Hogh, 2016; Pan, Zhang, Teo, & Lim, 2018; Serenko & Bontis, 2016; Su, 2020; Wang, Han, Xiang, & Hampson, 2019b; Wang, Law, Zhang, Li, & Liang, 2019a; Xia et al., 2019; Zhao et al., 2016). In those articles, KHo is defined as knowledge retention, in 5 of them (Anaza & Nowlin, 2017; Feng & Wang, 2019; Holten et al., 2016; Pan et al., 2018; Zhao et al., 2016) it is also explicit that the retained knowledge is not requested. Regarding intentionality, there is some ambiguity, as two articles (Pan et al., 2018; Serenko & Bontis, 2016) mentioned suggest the behavior is intentional and one (Wang, Han, et al., 2019b; Wang, Law, et al., 2019a) claims it is unintentional. Therefore, KHo is

characterized as follows: retention—not disseminating; no solicitation—no one asks for the knowledge; and intentionality.

Probably because it is more widely known, the concept of KS appears in only six articles (Fang, 2017; Gagné et al., 2019; Rhee & Choi, 2017; Semerci, 2019; Serenko & Bontis, 2016; Wang, Han, et al., 2019b; Wang, Law, et al., 2019a), being characterized as providing, exchanging, or transmitting knowledge in order to help the other. None of those articles divides KS into two processes, unlike van den Hooff and Ridder (2004), for whom KS involves two both: knowledge donation (KSd) and knowledge collection (KSc); with donation, intellectual capital is communicated to others, while collection, the intellectual capital of another individual is consulted.

When relating KHi and KS, Connelly et al. (2012) do not consider KHi to be the opposite of KS, that is, the lack of sharing. According to de Geofroy and Evans (2017), lack of sharing is unintentional, it occurs when the individual does not possess knowledge or he/she fails in sharing the knowledge. However, by treating KS as two processes (KSc and KSd), and characterizing KHi, KHo, KSd, and KSc as four aspects, as shown in Table 6, one can say that there is an association between the behaviors.

KHi is in opposition to KSc, and KHo is in opposition to KSd. The four behaviors can be perceived as positive when the individual is committed to the organization and negative when the individual is not committed to the organization. Figure 3 shows the relationship among the concepts.

Connelly et al. (2012) developed a scale to measure KHi according to the three types of KHi: evasive, rationalized, and playing dumb. Evasive KHi occurs when the individual provides incorrect knowledge or misleadingly promises to respond in the future to the person who requested the knowledge. Rationalized KHi is when the individual has an explanation for not providing the requested knowledge. The "playing dumb" KHi is when the individual pretends to be ignorant about the knowledge requested. The scale consists of 12 items, 4 for each type. This scale is used completely or partially in 38 articles, including the article where the authors develop the scale.

Serenko and Bontis (2016) present a three-item scale for KHi that is an adaptation of items employed by Connelly et al. (2012). The authors collect the perception of individuals regarding their own behavior and that of their colleagues. Malik et al. (2019) and Zakariya and Bashir (2020) use the scale from Serenko and Bontis (2016).

In five articles, including the article in which the scale is first introduced, Peng's (2012) scale is adopted. The author uses the term "withholding" rather than "hiding"; however, the meaning is the same.

TABLE 2 Number of articles published in each journal

Journal	Number of articles	JCR or H	Area
01. Journal of Knowledge Management	9	JCR = 4.604/ H = 106	Business and management
02. Journal of Organizational Behavior	6	JCR = 5.026/ H = 164	Business and management/Psychology
03. International Journal of Information Management	2	JCR = 8.210/ H = 096	Business and management/Computer science
04. European Journal of Work and Organizational Psychology	2	JCR = 2.882/ H = 061	Business and management/Psychology
05. Management Decision	2	JCR = 2.723/ H = 091	Business and management
06. Leadership & Organization Development Journal	2	JCR = 1.977/ H = 062	Business and management
07. International Journal of Hospitality Management	1	JCR = 6.701/ H = 106	Business and management
08. International Journal of Project Management	1	JCR = 6.620/ H = 134	Business and management
09. Journal of Applied Psychology	1	JCR = 5.851/ H = 259	Psychology
10. Computers in Human Behavior	1	JCR = 5.003/ H = 155	Psychology/Computer science
11. Journal of Business Research	1	JCR = 4.874/ H = 179	Business and management
12. Industrial Marketing Management	1	JCR = 4.695/ H = 125	Business and management
13. Telematics and Informatics	1	JCR = 4.139/ H = 056	Computer science
14. Human Resource Management Journal	1	JCR = 3.816/ H = 072	Business and management
15. Organization Science	1	JCR = 2.790/ H = 224	Business and management
16. Journal of Occupational and Organizational Psychology	1	JCR = 2.652/ H = 106	Business and management/Psychology
17. Sustainability	1	JCR = 2.576/ H = 068	Energy
18. The Service Industries Journal	1	JCR = 2.381/ H = 062	Business and management
19. Personality and Individual Differences	1	JCR = 2.311/ H = 155	Psychology
20. Journal of Nursing Management	1	JCR = 2.243/ H = 071	Nursing
21. International Journal of Emerging Markets	1	JCR = 2.067/ H = 026	Business and management
22. Frontiers in Psychology	1	JCR = 2.067/ H = 095	Psychology
23. Journal of Management & Organization	1	JCR = 1.935/ H = 030	Business and management
24. International Journal of Conflict Management	1	JCR = 1.806/ H = 050	Business and management
25. Knowledge Management Research & Practice	1	JCR = 1.583/ H = 034	Business and management
26. Journal of Managerial Psychology	1	JCR = 1.380/ H = 074	Business and management/Psychology

(Continues)

TABLE 2 (Continued)

Journal	Number of articles	JCR or H	Area
27. International Journal of Selection and Assessment	1	JCR = 1.200/ H = 057	Business and management/Psychology
28. Negotiation and Conflict Management Research	1	JCR = 1.027/ H = 012	Business and management
29. International Journal of Educational Management	1	H = 047	Business and management
30. VINE Journal of Information and Knowledge Management Systems	1	H = 028	Business and management/Computer science
31. Management Science Letters	1	H = 013	Business and management
32. International Journal of Knowledge Management Studies	1	H = 012	Business and management/Computer science
33. Journal of Organizational Effectiveness: People and Performance	1	—/—	Business and management

TABLE 3 Number of authors per article

Number of authors per article	Number of articles
1	6
2	13
3	8
4	16
5	5
6	2

TABLE 4 Authors with more than one published article

Author	Number of articles authored or co-authored/country of his/her institution
Matej Černe (always with Miha Škerlavaj and others)	4/Slovenia
Miha Škerlavaj (always with Matej Černe and others)	4/Norway
Anders Dysvik (2 with Matej Černe and Miha Škerlavaj and others)	2/Norway
Tomislav Hernaus (2 with Matej Černe and Miha Škerlavaj and others)	2/Croatia
Catherine Connelly (2 with Matej Černe and Miha Škerlavaj; 2 with D. Zweig)	4/Canada
David Zweig (2 with Catherine Connelly)	2/Canada

The three items are similar to some of the scale items developed by Connelly et al. (2012).

Lee et al. (2011) measured KHo indirectly, considering "protecting competence", with three items, "reluctance to spending time", with two-item, and "avoidance of exposure", with two items. The authors do not present the items used in the article.

Evans et al. (2015) developed a four-item scale for KHo, which considers two situations, solicited and unsolicited knowledge, causing an overlap between the concepts of KHi and KHo. For example, one of the scale items is "I keep news about what I am doing secret from others until the appropriate time" (Evans et al., 2015, p. 500).

Holten et al. (2016) uses only one item ("Do employees withhold information from each other?") to measure KHo. The authors consider KHo to occur when the individual hides knowledge that was not requested by another individual. Al-Abbadia et al. (2020) used three items to measure KHo, each item is from a different author. It is not aligned to the Kho's concept.

Connelly et al. (2012) present a scale for KHo; however, the concept adopted by the authors is different. In this article, KHo is considered to be the accumulation of knowledge by an individual, without the idea of relationship with other individuals. Anaza and Nowlin (2017) used this scale.

When analyzing the three scales proposed for KHi, it is clear the scale developed by Connelly et al. (2012) is the most complete, and best fits the concept. The other scales are derived from it in some aspect, but because they seek to include a limited number of items, they do not completely encompass the concept. Regarding KHo, although five versions were also found, none of them represents the concept as presented in this article, that is, with the characteristics as presented in Table 6. The items developed for KHi and KHo by the authors analyzed in this study are presented in Table B1 (Appendix B).

3.3 | Antecedents and consequents

The models examining KHi are described in Table C1 (Appendix C), considering antecedents, consequents, mediators, and moderators. Models that examine KHo are also presented.

In only one of the articles (Anaza & Nowlin, 2017) was KHi presented as an antecedent of KHo, although the term used for KHi was

TABLE 5 Countries where the authors' institutions are located

Continent of the institutions	Countries of the authors' institutions	Number of articles
Asia	**China**	**10**
Asia	**Turkey**	**3**
America	**Canada**	**3**
America	**United States**	**2**
Asia	**Pakistan**	**2**
Europe	Cyprus	1
Asia	India	1
Asia	Jordan	1
Asia	Malaysia	1
Europe	Netherlands	1
Asia	South Korea	1
Asia	Taiwan	1
Asia	United Arab Emirates	1
Asia, America	**China, United States**	**3**
Asia, America	South Korea/Korean Republic, United States	1
America, Asia	Canada, Pakistan	1
Asia, Europa	China, United Kingdom	1
Oceania, Asia	Australia, China	1
Europa, Oceania	Finland, Australia	1
Europe, Asia	United Kingdom, South Korea/Korean Republic	1
Asia	China, Pakistan	1
Asia	Indonesia, Taiwan	1
Asia	China, Bangladesh	1
Asia	Pakistan, United Arab Emirates	1
Europe	Slovenia, Norway	1
Europe	Switzerland, Germany	1
Europe, Oceania, Asia	Germany, Austria, Singapore	1
Oceania, Asia	Australia, China, Singapore	1
Europe, America	Norway, Canada, Slovenia	1
Europe, America	Denmark, United States, Norway	1
Asia, America	China, Canada, United States	1
Europe	Slovenia, Croatia, Norway	1
Europe, America	Croatia, Slovenia, Canada, Norway	1

"knowledge withholding". Similarly, KHi is only related to absorptive capacity in one article (Fong, Men, Luo, & Jia, 2018). However, in that article absorptive capacity is seen as a single construct, the authors did not distinguish its two dimensions: potential and realized absorptive capacity.

The studies also identify situations that need to be further discussed, such as the guilt construct, which is included in one study as

an antecedent of KHi (Fang, 2017) and in another as a consequent (Burmeister, Fasbender, & Gerpott, 2019).

3.4 | Future research

Holten et al. (2016) suggest investigating the relationship between KHi and KHo. This is corroborated by the fact that different concept of KHo differs widely among some authors, making it difficult to advance knowledge in this area. Anaza and Nowlin (2017) identify Knowledge Withholding (KW) as an antecedent of KHo. For those authors KHo means accumulation, which differs from the concept adopted in the present study, being more similar to the concept of KHi used herein.

Most of the authors suggest the need to identify the antecedents, mediators, moderators, consequents, and control variables related to KHi or KHo in future research. For the most part, the articles highlight the need to expand the elements related to the concepts of KHi and KHo. For example, Anaza and Nowlin (2017) consider it important to identify the effect of recognition and financial reward on KHi and KHo at the individual level. Gagné et al. (2019) point out the relevance of measuring time pressure or excessive workload as a moderator. All levels (individual, team, and organizational) are suggested for investigation.

The theories "Social Network Perspective", "Self-Perception Theory", and "Affective Events Theory" are suggested, respectively, by Abubakar, Behravesh, Rezapouraghdam, and Yildiz (2019), Jiang, Hu, Wang, and Jiang (2019), and Skerlavaj, Connelly, Cerne, and Dysvik (2018) for future research. Although unmentioned by the authors, other theories also deserve to be investigated in conjunction with the concepts of KHi and KHo, such as the "Absorbent Capacity Theory", which was used in only one article and not explored to its full potential.

The comparison of data collected among different cultures is mentioned in 19 articles as a suggestion for future research. This may be because several articles only collected data from Asian countries, which have different characteristics from Western countries. For example, Zhao et al. (2016) suggested the comparison between countries with collectivist and individualistic cultures, which corresponds to one of the dimensions for the assessment of country culture proposed by Hofstede, Hofstede, and Minkov (2010).

The experiment-based quantitative method (for example, in Khalid, Bashir, Khan, & Abbas, 2018) and the qualitative method with in-depth interviews (e.g., Offergelt, Spörrle, Moser, & Shaw, 2019) were suggested for use in future studies by the authors. Burmeister et al. (2019) suggest collecting data in association with KHi events. Longitudinal research, which may allow the identification of the effects of KHi and/or KHo, is suggested in 16 articles.

In 12 articles, the authors suggest the inclusion of larger samples, in some cases not only in terms of number but also in terms of coverage. Thus, the same study could include different business sectors, for example, Belschak, Hartog, and Hoogh (2018), and local and virtual teams (Pan et al., 2018).

According to authors such as Anaza and Nowlin (2017), to achieve a broader view of the behaviors it would be necessary to

TABLE 6 Summary of the concepts

Behavior	Intentional	Retention	Offering	Solicitation	Positive: organizational commitment	Negative: personal commitment
KHi	Yes	Yes	**No**	Yes	Protect knowledge	Rework Lose knowledge
KHo	Yes	Yes	**No**	**No**	Protect knowledge	Rework Lose knowledge
KSc	Yes	**No**	Yes	Yes	Avoid reworkconserve knowledge	Leak knowledge
KSd	Yes	**No**	Yes	**No**	Avoid rework conserve knowledge	Leak knowledge
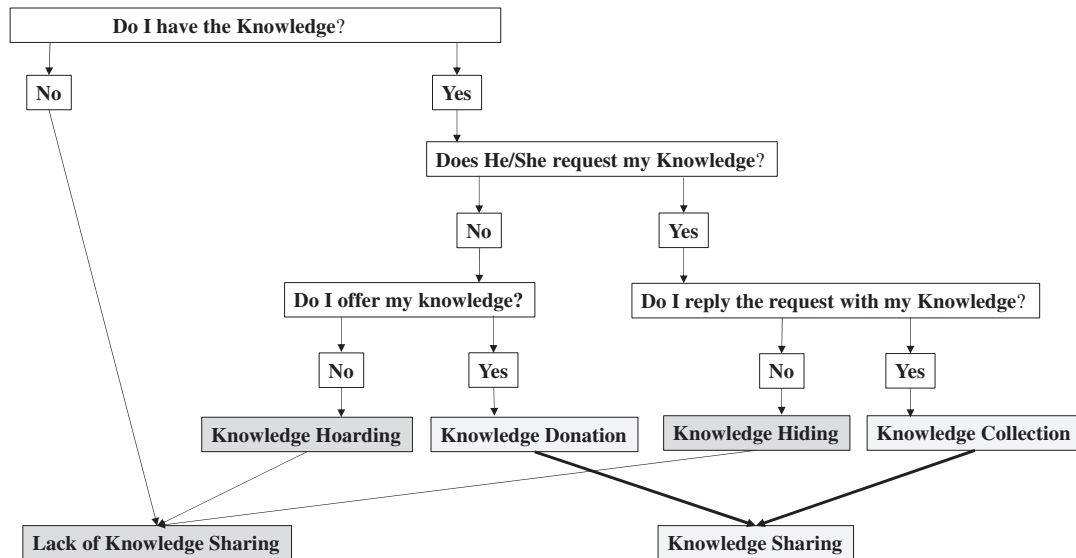
FIGURE 3 Relationship among KHi, KHo, and KS
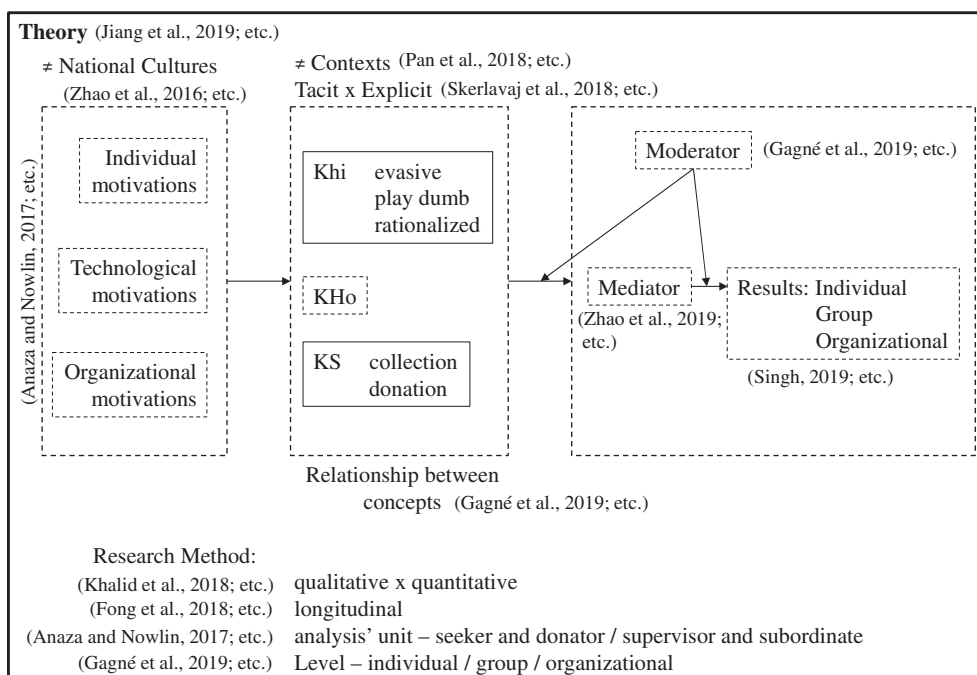
FIGURE 4 Suggestions for future research related to KHi, KHo, and KS

concurrently study both those who have the knowledge and those who need it. Such situations may also involve supervisors and subordinates, including the hierarchical issue in the relationship, as suggested by Connelly and Zweig (2015).

The use of the three types of KHi proposed by Connelly et al. (2012) is recommended by authors, including Fong et al. (2018). The separate measurement of tacit and explicit KHi is suggested by seven authors, such as Skerlavaj et al. (2018). According to the authors, tacit knowledge may take more time to share than explicit knowledge, which would make this type a target for KHi.

In three articles (Gagné et al., 2019; Holten et al., 2016; Zhu et al., 2019), there is a suggestion to expand research on KS and KHi in the same model. This approach, using the two concepts in the same model was found in three of the analyzed articles (Fang, 2017; Gagné et al., 2019; Rhee & Choi, 2017).

Figure 4 presents a framework that summarizes the suggestions for future research. Table D1, in Appendix D, lists the analyzed authors and all their suggestions.

The present study could be further developed by relating KHi, KHo, KSc, and KSd behaviors with the consequences of Nonaka and Takeuchi's (1995) knowledge creation model. Similarly, the links between those behaviors and other phenomena such as motivation or the level of trust in organizations can be explored. Organizational values and leadership style most likely influence the adoption of the behaviors, so the relationship between them should be analyzed. The level of organizational performance can be impacted by these behaviors, so it would be interesting to see their contribution to the organization's ability to innovate.

4 | CONCLUSION

This systematic literature review has demonstrated that the understanding of both KHi and KHo is fragmented and still in its early stages. This study, by mapping the researched characteristics, reveals gaps that have, in part, also been suggested as future research by the authors of the analyzed articles. A notable feature that needs investigation is the role of national and organizational culture in KHi and KHo, including intention, attitude, and behavior. Research that addresses the antecedents and consequents of KHi and KHo behaviors, as well as their mediators and moderators are also needed.

The expansion of research that includes the concepts KHi, KHo, and KS is suggested in two of the analyzed articles. The present study, by considering KS as two processes, collection and donation, is able to highlight the oppositional relationship between KHi and KSc, and between KHo and KSd. Understanding these relationships and their motivations might facilitate the flow of knowledge in organizations.

This research provides a framework for looking at current research, and identifies the need for future research on KHi and KHo, linking the concept of KS and its collection and donation processes. Although the number of articles is growing, this systematic literature review highlights that there is a great deal to be studied on the subject.

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APPENDIX A: ANALYZED PAPERS

The papers analyzed are: Al-Abbadia et al. (2020), Abdillah, Wu, and Anita (2020), Abubakar et al. (2019), Aljawarneh and Atan (2018), Alnaimi and Rjoub (2019), Anaza and Nowlin (2017), Anser, Ali, Usman, Rana, and Yousaf (2020), Arshad and Ismail (2018), Belschak et al. (2018), Bogilovic, Cerne, and Skerlavaj (2017), Burmeister et al. (2019), Cerne, Hernaus, Dysvik, and Skerlavaj (2017), Connelly et al. (2012), Connelly and Zweig (2015), Evans et al. (2015), Fang (2017), Feng and Wang (2019), Fong et al. (2018), Gagné et al. (2019), Garg and Anand (2020), Hernaus, Cerne, Connelly, Poloski, and Skerlavaj (2019), Holten et al. (2016), Huo, Cai, Luo, Men, and Jia (2016), Jahanzeb, de Clerq, and Fatima (2020), Jiang et al. (2019), Jilani, Fan, Islam, and Uddin (2020), Khalid et al. (2018), Khoreva and Wechtler (2020), Lee et al. (2011), Li et al. (2020), Malik et al. (2019), Offergelt et al. (2019), Pan et al. (2018), Peng (2012), Peng (2013), Rhee and Choi (2017), Semerci (2019), Serenko and Bontis (2016), Singh (2019), Skerlavaj et al. (2018), Su (2020), Wang, Law, et al. (2019a), Wang, Han, et al. (2019b), Xia et al. (2019), Yao, Zhang, Luo, and Huang (2020), Zakariya and Bashir (2020), Zhang and Min (2019), Zhao and Xia et al. (2019), Zhao et al. (2016), and Zhu et al. (2019).

APPENDIX B: SCALES FOR KHI AND KHO

TABLE B1 Scales developed for KHi and KHo

Concept	Items	Observations	Level	Author
KHi: Evasive Playing Dumb Rationalized	In this specific situation, I... 1. Agreed to help him/her but never really intended to. 2. Agreed to help him/her but instead gave him/her information different from what s/he wanted. 3. Told him/her that I would help him/her out later but stalled as much as possible. 4. Offered him/her some other information instead of what he/she really wanted. 1. Pretended that I did not know the information. 2. Said that I did not know, even though I did. 3. Pretended I did not know what s/he was talking about. 4. Said that I was not very knowledgeable about the topic. 1. Explained that I would like to tell him/her, but was not supposed to. 2. Explained that the information is confidential and only available to people on a particular project. 3. Told him/her that my boss would not let anyone share this Knowledge. 4. Said that I would not answer his/her questions."	Scale most used by other authors	Individual	Connelly et al. (2012)
KHi	"Upon receiving a knowledge request: 1. I often communicate only part of the whole story to my fellow colleagues. 2. I often twist the facts to suit my needs when communicating with my fellow colleagues. 3. I often leave out pertinent information or facts when communicating with my fellow colleagues.	Adapted from Connelly et al. (2012). Nevertheless, they do not use the three types of KHi separately.	Individual	Serenko and Bontis (2016)
KW	"1. Do not want to transform personal knowledge and experience into organizational knowledge. 2. Do not share innovative achievements. 3. Do not share helpful information with others."	Adapted from Connelly et al. (2012). Nevertheless, they do not use the three types of KHi separately.	Individual	Peng (2012)
Kho Protecting Competence Reluctance to Spending Time Avoiding Exposure	-	Os autores apresentam apenas o number of items: 3, 2, and 2. The types may be considered motivations for Kho behavior.	Individual	Lee et al. (2011)
Kho	"1. I keep news about what I am doing secret from others until the appropriate time. 2. I avoid releasing information to others in order to maintain control.	The authors use the term KHo to refer to situations when knowledge is requested and when it is not The authors use the term information instead of knowledge.	Individual	Evans et al. (2015)

TABLE B1   (Continued)

Concept	Items	Observations	Level	Author
	3. I control the release of information in an effort to present the profile I want to show. 4. Information is a resource that needs to be carefully guarded."			
Kho	"Do employees withhold information from each other?"	This item needs to be contextualized in order to correspond to the KHo concept. The authors use the term information instead of knowledge.	Organizational	Holten et al. (2016, p. 220)
Kho	"1. I am a "pack rat" when it comes to information. 2. I tend to accumulate and store information. 3. I like to stockpile information just in case I might need it. 4. I never throw away any information that I think might be useful in the future."	These items focus on individuals that keep knowledge to themselves without considering their relationship with other people. The authors use the term information instead of knowledge.	Individual	Connelly et al. (2012, p. 73)
Kho	"Knowledge accumulation. Knowledge share refuse. Knowledge is power."	These items focus on individuals that keep knowledge to themselves considering their relationship with other people.	Individual	Anaza and Nowlin (2017)

APPENDIX C: ANTECEDENTS AND CONSEQUENTS

TABLE C1   Antecedents and consequents: KHi and KHo

Antecedent	Partial mediation	Total mediation	Moderation	Consequent	Reference
"Tolerance to workplace incivility"	"employee cynicism"			**KHi**	Aljawarneh and Atan (2018)
"Distributive (in) justice", "Procedural (in) justice", and "Interactional (in) justice" (formed from "Informational (in) justice" and "Interpersonal (in) justice)"				**KHi**	Abubakar et al. (2019)
"Psychological entitlement"	**KHi**			"Extra role behavior"	Alnaimi and Rjoub (2019)
"Internal competition", "Past opportunistic co-worker behavior", "Lack of KS rewards", "Lack of feedback for KS", and "Neuroticism"		Knowledge withholding (**KHi**)		**KHo (accumulation)**	Anaza and Nowlin (2017)

(Continues)

TABLE C1 (Continued)

Antecedent	Partial mediation	Total mediation	Moderation	Consequent	Reference
"Work incivility"			"personality disposition"	**KHi**	Arshad and Ismail (2018)
"Machiavellianism"			"Ethical leadership"	**KHi**	Belschak et al. (2018)
KHi			"Cultural intelligence"	"Creativity"	Bogilović et al. (2017)
KHi		"Guilt" and "Shame"		"Other-oriented behavior"	Burmeister et al. (2019)
KHi			"Mastery climate", "Decision autonomy", and "Task interdependence"	"Innovative work behavior"	Černe et al. (2017)
"Knowledge complexity", "Task relatedness", "Distrust", and "Knowledge sharing climate"				**KHi**	Connelly et al. (2012)
KHi				"Hurt relationship" and "future withholding"	Connelly and Zweig (2015)
"Guilt", "Self-referenced of fear", and "Other referenced of fear"				**KHi**	Fang (2017)
KHi		"Absorptive capacity"	"Task interdependence" (KHi and AC)	"Team creativity"	Fong et al. (2018)
"Job autonomy", "Cognitive job demands", and "Task interdependence"		"External regulation", "Introjected regulation", and "Autonomous"		**KHi**	Gagné et al. (2019)
"Personal competitiveness"		"Task interdependence" and "Social support"		**KHi**	Hernaus et al. (2019)
"Psychological ownership"		"Territoriality"		**KHi**	Huo et al. (2016)
KHi		"Psychological safety"	"Organizational cynicism"	"Thriving"	Jiang et al. (2019)
"Abusive supervision"	"Interpersonal justice"		"Islamic work ethics"	**KHi**	Khalid et al. (2018)
KHo, "Technology acceptance" and "Motivation"				"Intention to exchange knowledge"	Lee et al. (2011)
"Perceived organizational politics"	**KHi**			"Employee creativity"	Malik et al. (2019)
"Leader signaled KHi"		**KHi**		"Turnover intention", "Job satisfaction" and "Empowerment"	Offergelt et al. (2019)
"Machiavellianism", "Narcissism", and "Psychopathy"		"Transactional psychological contract"		**KHi**	Pan et al. (2018)

TABLE C1 (Continued)

Antecedent	Partial mediation	Total mediation	Moderation	Consequent	Reference
"Personality variables"				**KHi**	Peng (2012)
"Knowledge-based psychological ownership"	"Territoriality"		"Organization-based psychological ownership"	**KHi**	Peng (2013)
"Learning goal orientation", "Avoiding goal orientation", and "Proving goal orientation"		**KHi**	"Social status"	"Creative performance"	Rhee and Choi (2017)
"Task conflict" and "Relationship conflict"				**KHi**	Semerci (2019)
"Culture", "Perceived compensation per full time equivalent", and "Involuntary turnover rate"		"Intra-organizational KHi"		**KHi**	Serenko and Bontis (2016)
"Territotality"	**KHi**			"Task performance" and "Workplace deviance"	Singh (2019)
"Time pressure"			"Prosocial motivation" and "Perspective taking"	**KHi**	Skerlavaj et al. (2018)
"Perceived **KHi**"			"Social interaction" "Reward structure"	"Seeker's sale performance" "Team viability"	Wang, Law, et al. (2019a)
"Job engagement"		"Job-based psychological ownership"	"employees' avoidance motivation"	**KHi**	Wang, Han, et al. (2019b)
KHi	"Team learning"		"Team stability"	"Project team performance"	Zhang and Min (2019)
"Negative affective states"	"Moral disengagement"		"Ethical leadership"	**KHi**	Zhao & Xia, 2019
"Work place ostracism"			"Negative reciprocities and beliefs" and "Moral disengagement"	**KHi**	Zhao et al. (2016)
"Performance-prove goal orientation"		**KHi**	"Group focused feedback" and "Individual focused feedback"	Creativity	Zhu et al. (2019)
"Altruistic leadership"		"Leader-triggered positive emotion" and "Leader–member exchange"		**KHi**	Abdillah et al. (2020)
"Ethical leadership"	"Meaningful work"		"Harmonious work passion"	**KHi**	Anser et al. (2020)
"Abusive supervision"	"Job security"		"Mastery climate" and "Performance climate"	**KHi**	Feng and Wang (2019)
KHi		Loneliness	Conscientiousness	Affective Commitment	Garg and Anand (2020)

(Continues)

TABLE C1 (Continued)

Antecedent	Partial mediation	Total mediation	Moderation	Consequent	Reference
"Perceived organizational injustice"	"Organizational disidentification"		Benevolence	**KHi**	Jahanzeb et al. (2020)
KS	"Employees' Ambidexterity"		**KHi**	Sustainable performance	Jilani et al. (2020)
KHi	"Well-being"			"In-role performance" and "innovative performance"	Khoreva and Wechtler (2020)
KHi	"creative process engagement"		"team territorial climate"	"idea implementation"	Li et al. (2020)
"knowledge leadership"			"Psychological ownership"	**KHi**	Xia et al. (2019)
Workplace bullying	"Organizational Identification" and "Emotional Exhaustion"		"Forgiveness Climate"	**KHi**	Yao et al. (2020)
Target's **KHi** Perception			"Supervisor Support for Creativity" and "Creative Self-Efficacy"	Employee Creativity	Zakariya and Bashir (2020)
"accuracy in expertise recognition", "expertise level", "degree centrality in one's social network", "betweenness centrality in one's social network"				**KHo**	Su (2020)
KHo		"employee's bargaining power" and "employee's influence in the work unit"		Job performance	Evans et al. (2015)
"Negative acts"	"Trust" and "Justice"			**Kho**	Holten et al. (2016)
"Knowledge management processes"			KHo	**Innovation performance**	Al-Abbadia et al. (2020)

APPENDIX D: FUTURE RESEARCH

TABLE D1 Suggestions for future research into KHi, KHo, and KS

Author	Theory	Antecedent	≠ Context	Tacit and explicit	KHi, KHo, KS together	Mediator	Moderator	Results	Quantitative	Qualitative	Longitudinal	Unit of analysis	Level	≠ National culture
Total	3	28	12	7	3	6	14	11	15	3	16	9	18	19
Abubakar et al. (2019)	X	X	X									X	X	
Aljawarneh and Atan (2018)									X					X
Alnaimi and Rjoub (2019)		X					X						X	
Anaza and Nowlin (2017)		X						X			X	X	X	
Arshad and Ismail (2018)		X									X		X	
Belschak et al. (2018)			X				X				X			
Bogilovic et al. (2017)							X	X	X			X	X	X
Burmeister et al. (2019)		X							X					
Cerne et al. (2017)			X											
Connelly et al. (2012)		X					X	X					X	
Connelly and Zweig (2015)		X					X	X				X		
Evans et al. (2015)		X							X		X		X	
Fang (2017)		X					X	X			X			
Fong et al. (2018)							X	X			X			
Gagné et al. (2019)		X			X			X	X				X	
Hernaus et al. (2019)		X	X					X						
Holten et al. (2016)		X			X									
Huo et al. (2016)		X							X					
Jiang et al. (2019)	X	X				X	X		X				X	
Khalid et al. (2018)							X		X		X			
Lee et al. (2011)														
Malik et al. (2019)		X					X	X						
Offergelt et al. (2019)		X									X			X
Pan et al. (2018)		X	X				X						X	

(Continues)

TABLE D1 (Continued)

Author	Theory	Antecedent	≠ Context	Tacit and explicit	KHi, KHo, KS together	Mediator	Moderator	Results	Quantitative	Qualitative	Longitudinal	Unit of analysis	Level	≠ National culture
Peng (2012)	X										X			
Peng (2013)									X					
Rhee and Choi (2017)	X			X					X		X			X
Semerci (2019)	X	X	X								X		X	X
Serenko and Bontis (2016)	X	X										X	X	
Singh (2019)				X				X					X	
Skerlavaj et al. (2018)	X	X		X		X			X					
Wang, Law, et al. (2019a)														X
Wang, Han, et al. (2019b)	X		X	X			X				X	X	X	X
Abdillah et al. (2020)	X		X						X					X
Al-Abbadia et al. (2020)								X	X		X			
Anser et al. (2020)	X												X	X
Feng and Wang (2019)	X	X	X	X									X	X
Garg and Anand (2020)	X	X	X								X			X
Jahanzeb et al. (2020)				X		X							X	X
Jilani et al. (2020)			X						X		X			X
Khoreva and Wechtler (2020)			X					X			X		X	
Li et al. (2020)									X	X				X
Su (2020)			X											X
Xia et al. (2019)						X				X		X		X
Yao et al. (2020)						X							X	
Zakariya and Bashir (2020)						X		X			X			
Zhang and Min (2019)	X			X										X
Zhao and Xia (2019)						X						X	X		X
Zhao et al. (2016)	X													X
Zhu et al. (2019)					X		X							X