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Analyzing teachers' competencies in career guidance: a systematic review

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While it is recognized that teachers play a vital role in supporting students in the career-planning process, their competencies in school-based career guidance remain underexplored. Understanding these competencies is important for enhancing the effectiveness of the career guidance provided by teachers. The aim of this systematic review was to collate the empirical evidence regarding teachers' competencies in career guidance, to situate these findings within the context of a professional-competence model, and to identify significant gaps in the research. We conducted a systematic literature search in six different databases, targeting studies that focused on secondary-school teachers involved in career guidance. From an initial pool of 4,768 studies, 31 remained for a further analysis after we double coded 15 percent of the studies. This study shows that while secondary-school teachers generally hold positive attitudes toward career guidance in schools, they recognize shortcomings in their own knowledge and skill sets and express a need for further training. In contrast to teachers' knowledge and attitudes, other aspects of professional competence, such as motivational orientations and self-regulation skills, received less attention in the analyzed papers. Finally, this review highlights a notable lack of theoretical modeling regarding teachers' competencies in career guidance.

KEYWORDS

career guidance, teacher professionalism, teachers' competencies, teacher education, school-to-work transition, systematic review

1 Introduction

Teachers not only play an important role in subject-related learning but also significantly contribute to supporting students in the career-planning process (Lam and Hui, 2010; Lai-Yeung, 2014; Hearne and Galvin, 2015; Parola et al., 2022; Wong et al., 2022). On the one hand, teachers can have official tasks and responsibilities in career guidance within schools (Hooley et al., 2015). This may encompass providing career-related information, promoting career-related skills, integrating career-related topics into subject lessons, organizing career-related activities, offering individual career counseling, or collaborating with the world of work and other stakeholders (Cedefop et al., 2021; Stalder et al., 2023). On the other hand, when teachers are not explicitly tasked with such responsibilities, they are still part of adolescents' immediate social environment and can serve as an informal source of advice and support in the career-planning process (Hutchinson, 2012; Thurnherr et al., 2013). Such social support and appropriate career preparation are essential for students' successful transition from school to work or tertiary educational paths (Steiner et al., 2019). The recognition of schools' essential part in supporting and preparing adolescents for career choices dates back to the 1970s (Guichard,

2001). Since then, the importance of school-based careers guidance has continued to grow, as adolescents need to be prepared to navigate a constantly changing world of work (Watts, 2013; Mann et al., 2020; Cedefop et al., 2021). In the school context, the term career guidance refers to interventions aimed at providing students with information, support, and resources to help them make informed career decisions, prepare them for the transition to postsecondary school life and empower them to succeed in their careers and personal lives (Dodd et al., 2021; Wong et al., 2022). Nowadays, career guidance in schools is recognized in many countries as a multiprofessional activity that may involve teachers, counselors, career professionals, psychologists, and other specialists (Hearne and Neary, 2021; Hooley, 2022). The significance of teachers' involvement in career guidance is underscored by empirical studies that show teacher support on career-related topics has significant impacts on various aspects of students' career planning (Wong et al., 2021) and career development (Zhang et al., 2018), such as work-outcome expectations (Ali and McWhirter, 2006) and career-decision self-efficacy (Metheny et al., 2008). In a recent study, Parola et al. (2024) demonstrated that career-related teacher support indirectly influences students' career decision self-efficacy through the mediating role of career adaptability. However, the specific roles and responsibilities of teachers in career guidance vary significantly across countries due to differences in organizational structures and school policies, making career guidance programs highly context-specific (Watts and Sultana, 2004; Pham et al., 2024). For example, in Switzerland, career guidance is systematically anchored in the curriculum at lower secondary level and is a mandatory responsibility for class teachers (Kamm et al., 2020). Conversely, in the United States, school counselors are often primarily responsible for career guidance, with teachers playing a supplementary and supportive role in these efforts (Chen, 2005). According to Hooley et al. (2015), teachers' roles in career guidance can be categorized as follows: first, if responsibilities for students' career planning are outsourced to external organizations, teachers may only have an informal role. Second, teachers may assume partial responsibility for students' career planning, although this area is not highly professionalized. Last, teachers may receive specialized training to perform a wide array of tasks related to students' career planning. Overall, there is a growing trend toward involving teachers more extensively in career guidance and increasing their responsibilities in this area, although they often lack sufficient training (Kuijpers and Meijers, 2017). As with other aspects of education, the success of career guidance in schools depends on teachers' competencies for this task (Koch, 2019; Jentsch and König, 2021). Although teachers contribute significantly to career guidance and affect students' career development, there is limited knowledge about their professional competence in this area (Dreer and Weyer, 2020).

Consequently, from the perspective of teacher education, it is important to examine what is empirically known about the level of teachers' competencies in the context of career guidance in schools. Gaining insight into these competencies is vital for creating further and effective training programs for teachers. Previous reviews have focused on the influence of teacher support on students' career decision-making and development (Zhang et al., 2018), as well as the roles teachers play in supporting students' career development (Wong et al., 2021). In contrast, our systematic review specifically aims to identify empirical evidence related to teachers' competencies in career guidance and situate these findings within a professional-competence model. Additionally, we seek to highlight significant research gaps, and provide information for teachers, teacher educators, and policymakers to enhance teachers' competencies.

2 Conceptual framework

In this section, we define the term *career guidance* and clarify its application within the context of this paper. We then justify our selection of Baumert and Kunter's (2013) multidimensional model of professional competence as the theoretical framework for this systematic review and present the research questions.

2.1 Clarification of terminology

Internationally, various terms such as *career guidance*, *career education*, *career counseling*, and *vocational guidance* are used to describe students' career preparation within the school context (Sultana, 2013; Pham et al., 2024). In the literature these terms are often used interchangeably (Hughes et al., 2016). The lack of terminological consensus has led to confusion and research challenges (McMahon, 2014). In the early 20th century, vocational guidance aimed to support students in making occupational choices. Due to changes in the world of work and theoretical approaches since the 1960s, the focus has shifted, and *career* has been increasingly favored over *vocational*. The term *career guidance* now broadly refers to services designed to assist individuals in making career choices and managing their careers (OECD, 2004). In the school context this comprehensive definition includes career information provision, skills assessment and development, and curriculum-based interventions often referred to as career education (Hooley et al., 2015). In this study, we understand *career guidance* broadly, using it to describe a multifaceted series of career-guidance activities within schools, such as addressing careers in the curriculum, providing information on possible career paths, and conducting guidance dialogues (Dodd et al., 2021).

2.2 Teachers' professional competence

There is broad consensus that teacher competence is essential for professional success and is an important goal for the professional development of teachers (Cochran-Smith and Zeichner, 2005; Zlatkin-Troitschanskaia et al., 2017; Jentsch and König, 2021). Competence is a multidimensional construct encompassing the learnable individual resources needed to meet specific professional demands, including knowledge, skills, attitudes, and motivational variables (Weinert, 2001; Kunter et al., 2013; Blömeke et al., 2015; Ufer and Neumann, 2018). Teacher competence significantly influences instructional quality and students' learning outcomes, so developing competencies through teacher education is essential (Kunter et al., 2013; Jentsch and König, 2021). Identifying which competencies are pivotal for effective professional performance is therefore of paramount importance. Shulman (1987) emphasized the necessity of both content knowledge (CK) and pedagogical-content knowledge (PCK) for teachers. However, Baumert and Kunter (2013)

argued that knowledge alone does not sufficiently explain differences in teachers' success (Kunter et al., 2013). They identified three additional core aspects of competence and proposed a multidimensional model of professional competence that includes (1) knowledge, (2) beliefs, (3) motivational orientations, and (4) self-regulation, as shown in Figure 1. According to this model, teachers are considered competent when their professional knowledge is coupled with productive beliefs, appropriate motivational orientations, and effective self-regulation. This model of professional competence has been applied, in particular, to model and measure the competencies of mathematics teachers (Kunter et al., 2013). Due to its generic structure, it is also suitable for research in other subject areas, such as bilingual education (Scherzinger and Brahm, 2023) or education for sustainable development (Lohmann et al., 2021). We therefore assume that Baumert and Kunter's (2013) multidimensional model of professional competence can be applied to the field of career guidance as well. Whether formally or informally involved in career guidance, teachers require specific cognitive and affective-motivational competencies to support their students (Dreer and Weyer, 2020). Currently, there is a notable lack of theoretical models that specifically address the competencies needed for teacher training in career guidance. Although competence frameworks exist for career-guidance professionals (Cedefop et al., 2021), they are not tailored to the teaching profession. Baumert and Kunter's (2013) professional-competence model provides a comprehensive framework for integrating various aspects of teachers' professional competence, making it suitable for systematically reviewing existing empirical findings. In German-speaking countries, this model has already been used to model or investigate teachers' knowledge and beliefs in career guidance (Dreer, 2013; Fletemeyer, 2021; Lembke, 2021).

In the following sections, we describe the four core aspects of the model in more detail and provide examples of how they apply to career guidance.

The aspect of knowledge is pivotal to teachers' professional competence (Shulman, 1987; Blömeke et al., 2011). It encompasses content knowledge (CK), pedagogical-content knowledge (PCK), pedagogical-psychological knowledge (PK), organizational knowledge (OK), and counseling knowledge (CoK). In the context of school-based career guidance, content knowledge encompasses understanding adolescent career planning, while pedagogical-content knowledge relates to the ability to design a lesson on a career-related topic. Organizational knowledge includes an understanding of how career guidance is integrated into the overall school framework, and counseling knowledge encompasses coaching techniques that support students in their career-planning process (Dreer, 2013).

Beliefs form the second aspect of teachers' professional competence; they differ from knowledge in their subjectivity and reliance on perception rather than accuracy (Richardson, 1996). These beliefs, which are shaped by significant social experiences, influence teachers' pedagogical perspectives and impact classroom practices (Skott, 2015). Various classification approaches have been proposed for outlining the domains of teachers' beliefs; this review adopted Calderhead's (1996) classification, which has also been applied in career-guidance research (Fletemeyer, 2021). Additionally, we examined attitudes, which are defined as psychological tendencies toward liking or disliking something (Eagly and Chaiken, 1993). In the context of career
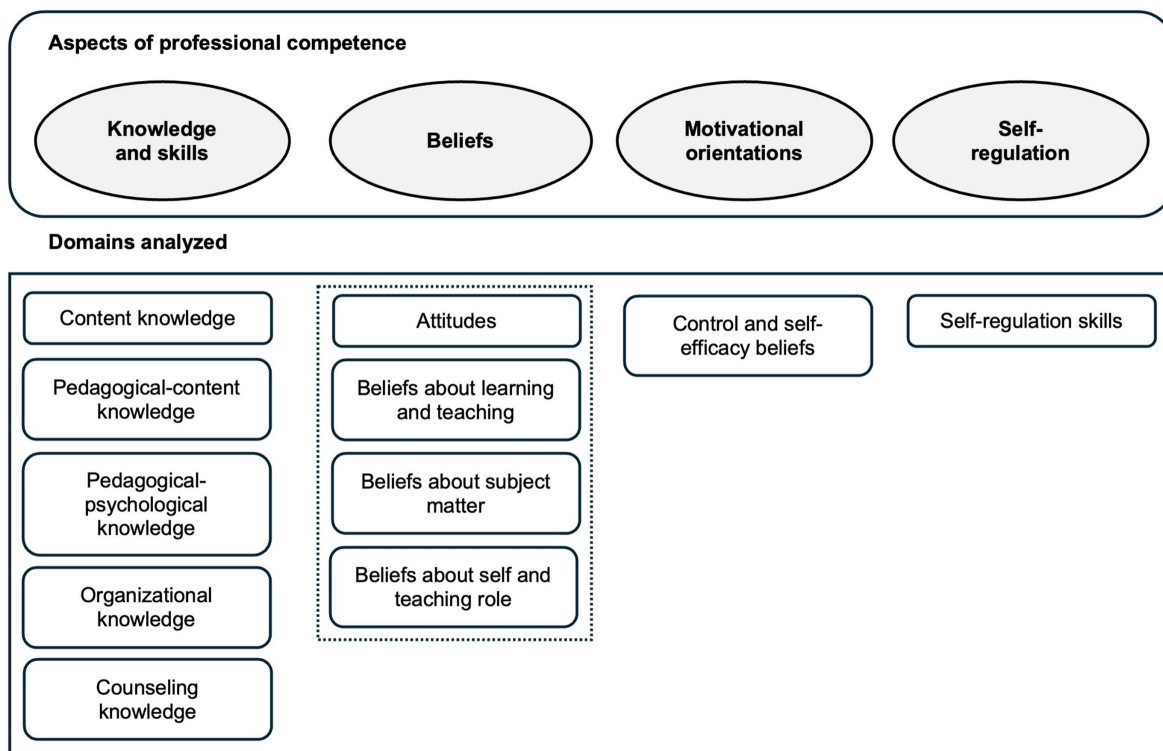

FIGURE 1
Model of teachers' professional competence (Baumert and Kunter, 2013); beliefs domain adapted from Calderhead (1996) and Eagly and Chaiken (1993) (dotted outline).

guidance, this could mean that teachers have a positive attitude toward careers guidance in schools and hold productive beliefs about supporting students in this area (Fletemeyer, 2021).

Third, motivational orientations are crucial for psychological functioning and significantly influence behavior and intention maintenance. These orientations can be operationalized in different ways; this review focuses on the control and self-efficacy beliefs of career-guidance teachers. The self-efficacy construct covers teachers' beliefs regarding their ability to support and enhance students' learning and behavior (Bandura, 1977; Tschannen-Moran and Woolfolk Hoy, 2001). In the context of career guidance, this could mean that teachers feel confident in supporting students throughout the career-planning process.

The fourth aspect, self-regulation, has a specific meaning in Baumert and Kunter's (2013) professional-competence model that differs from its use in the context of student learning (Kunter, 2013). Self-regulation encompasses the ability to maintain engagement while controlling one's own behavior and developing adaptive strategies for stressful situations. It allows teachers to manage personal resources and balance involvement with disengagement (Klusmann et al., 2008). In the context of career guidance, self-regulation could mean that teachers manage stress factors such as limited time or students' unrealistic career aspirations (Stalder et al., 2023).

2.3 Research questions

This systematic review was conducted to gain a deeper understanding of what is empirically known worldwide about teachers' competencies in career guidance. The following research questions (RQs) guided the study:

- RQ1: What knowledge and skills do teachers have for providing career guidance?
- RQ2: What are the beliefs and attitudes of teachers toward career guidance?
- RQ3: What is known about teachers' confidence in their ability to engage with students regarding career guidance?
- RQ4: What self-regulatory skills do teachers use to manage their resources in career guidance?

3 Methods

To address our research questions, we conducted a systematic literature review. To ensure the identification of all relevant studies, we adopted a mixed-studies-review approach (Thomas et al., 2017). The systematic review followed general PRISMA guidelines for systematic literature searches (Page et al., 2021). The procedure started with a nonsystematic exploration to identify various terminologies in the field and to clarify the search terms. Subsequently, inclusion and exclusion criteria were formulated. Following this, we conducted a

systematic search. Studies were located through an advanced literature search of databases and then screened and selected. The gathered information was coded and synthesized (Gough et al., 2017).

3.1 Search terms

Given the multitude of terminologies used in the research field (McMahon, 2014), it was crucial to employ a broad definition of career guidance in this study and to use a range of search terms. A narrow understanding could have resulted in the exclusion of relevant studies. The search terms, including their combinations and derivatives utilized in the electronic-database search, are presented in Table 1. Slight modifications were made to the search terms to align them with the functionality of each database.

3.2 Inclusion and exclusion criteria

The boundaries for the systematic review were set by defining inclusion and exclusion criteria. These can be seen in Table 2. Studies were included if they met the following criteria: (a) publication in a peer-reviewed journal, (b) availability in English or German, (c) application of a qualitative, quantitative, or mixed-methods approach, (d) focus on academic or vocational teachers at the secondary school level, and (e) investigation of at least one core aspect of professional competence as outlined by Baumert and Kunter (2013). Studies were excluded if they focused on higher education or primary school levels, special education contexts, pre-service teachers, or the assessment of students' opinions or performance. No restrictions were placed on the year of publication, resulting in a coverage of articles published from 1972 to 2022. In our study, we concentrated on teachers from secondary schools, including upper secondary levels such as programs for vocational education and training (VET), because in some countries such as Germany or Switzerland with a dual-education system, adolescents enter vocational programs at a relatively young age (Masdonati, 2010).

3.3 Study selection, coding, and interrater reliability

The search was conducted in major electronic databases in April 2023, including PsycINFO, ERIC, Web of Science, Scopus, and PSYNDEXplus. Additionally, the German database Education Research Portal was searched. Figure 2 provides an overview of each stage of the selection process and the search results. The search returned 4,768 records. In the first step, the first author screened all the abstracts for eligibility based on the inclusion and exclusion criteria. After the availability of full text was checked, this screening resulted in 43 studies. 15% of the abstracts were independently coded

TABLE 1 Keywords.

Career guidance	AND	Secondary school	AND	Teachers
"career orientation" OR "career guidance" OR "career counseling" OR "vocational counseling" OR "career education"		"high school*" OR "secondary school*" OR "middle school*" OR "vocational school*" OR "vocational education*"		teacher*

TABLE 2 Inclusion and exclusion criteria.

Type	Inclusion criteria	Exclusion criteria
Publication	Published in peer-reviewed journals	Book chapters, doctoral dissertations, conference proceedings and reports
Language	English, German	Any other language
Study type	Empirical studies using a qualitative, quantitative, or mixed-methods approach	Meta-analysis, reviews
Study population	Academic and vocational teachers from secondary-school levels	Students, preservice teachers, elementary or postsecondary teachers
Research focus	Studies that provided answers to at least one research question	Other focus such as career guidance for special education, general guidance

by a second author. The interrater reliability was good (Cohen's Kappa = 0.85). The few discrepancies were discussed until mutual agreement was reached. In a second step, the full text of the remaining studies was examined, resulting in 31 eligible studies for our review. Reasons studies were excluded from the review are, e.g., wrong focus. Finally, 31 studies met all inclusion criteria. A descriptive summary of study characteristics is provided in Table 3.

3.4 Data extraction and analysis

The data were extracted from the results and discussion sections of the studies. Special care was taken to ensure that any additional interpretations in the discussion section of a study would not influence the results. To analyze both qualitative and quantitative data, we adopted a content-analysis method (Elo and Kyngäs, 2008). The MAXQDA 2022 software package (VERBI Software, 2021) was selected due to its flexibility, especially when subcoding was needed. In the first round, the data were analyzed by employing deductive content analysis based on the predefined categories from the theoretical framework outlined by Baumert and Kunter (2013). To structure the findings within the main categories, an inductive content analysis was carried out in a second round, in which the subcodes emerged from the data. This process aimed to create a manageable set of subcategories that accurately represented the diversity of topics covered within the data. To ensure transparency and replicability, two authors independently performed all the coding. They held regular meetings to address coding queries, to resolve any disparities in their analyzes, and to maintain the code book. If necessary, a third author was consulted to resolve disparities.

4 Results

This section provides an overview of the descriptive characteristics of the included studies and summarizes the main findings of the systematic review with regard to the research questions. Figure 3 displays the examined aspects of teachers' professional competence, and the related themes identified in the study. Table 4 provides an overview of the coded domains and related themes in each study.

4.1 Study characteristics

The 31 included studies involved a total of $N = 4{,}872$ participants. There were 3,166 participants in the quantitative studies, 230

participants in the qualitative studies, and 1,476 participants in the mixed-methods studies.[1] The studies were conducted in the United States (11), Europe (9), Asia (5), Africa (3), and Australia (3). Fifteen studies were published between 2011 and 2022, six between 2001 and 2010, one between 1991 and 2000, another six 1981 between 1990, and three between 1971 and 1980. Thirteen studies had a quantitative design based on surveys, eight studies had a qualitative design based on interviews or focus-group interviews, and ten had a mixed-methods design, most of which included both interviews and surveys, sometimes in combination with additional data-collection methods such as group discussions. The studies examined the experiences of secondary- (24) and middle-school (2) teachers, and four studies covered multiple levels. Five studies targeted vocational teachers, and four included mixed samples of teachers and educational staff.
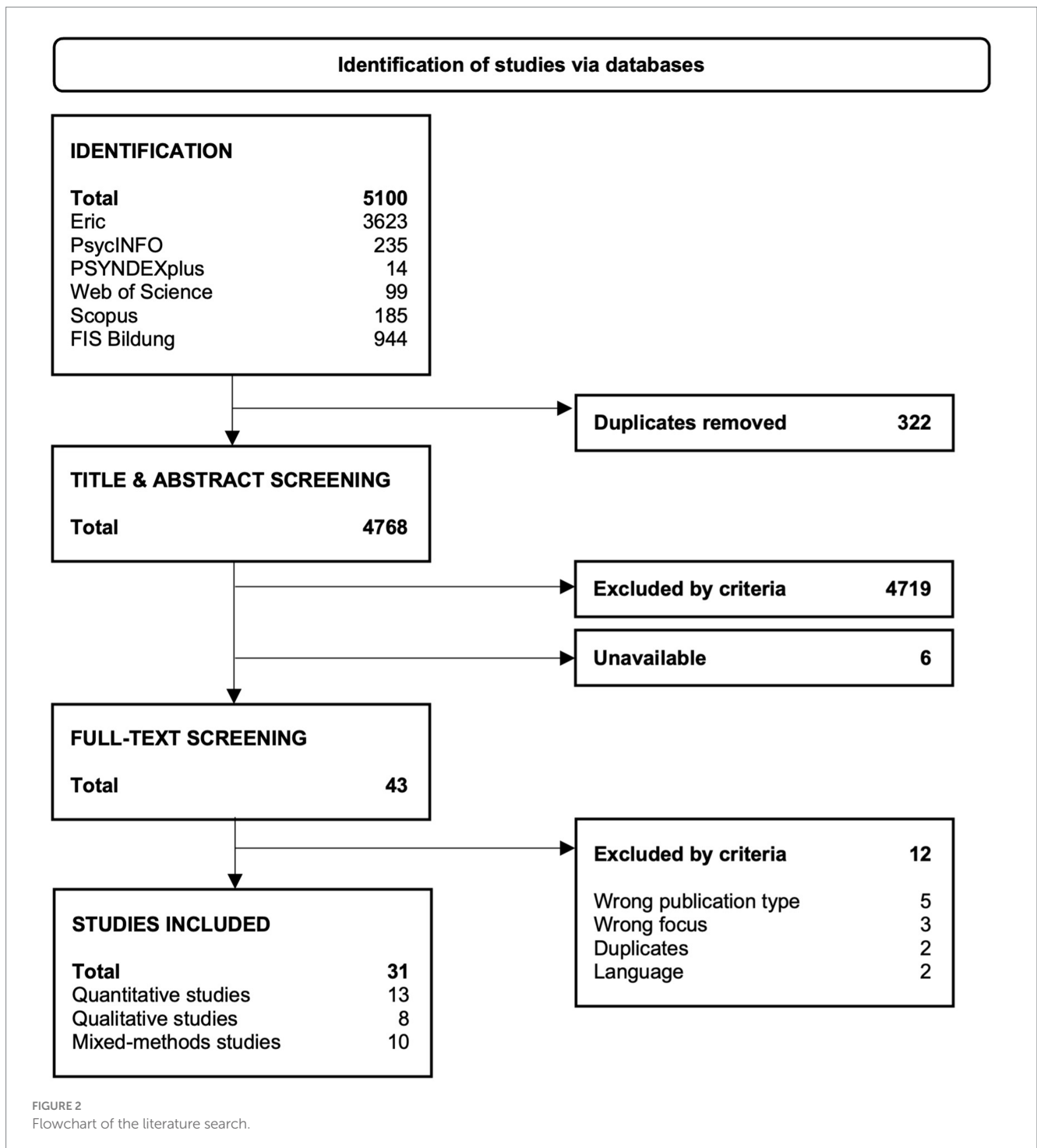
4.2 RQ1: teachers' knowledge and skills

Six quantitative and mixed-methods studies, plus one qualitative study, assessed teachers' knowledge and skills in career guidance based on self-reported data. These studies offered little theoretical clarification on the specific kinds of knowledge and skills teachers should possess to adequately fulfill their roles in career guidance. No findings related to pedagogical-psychological knowledge emerged. Two studies focused on general career-guidance knowledge: In a German study by Dreer and Kracke (2011), 135 teachers estimated that 54% of their peers had the necessary knowledge to provide career guidance, but "necessary knowledge" was not defined. Gross and Kaplan (1975) discovered that teachers were less informed about career education than about drug, ecology, and sex education, with lower-level teachers feeling less knowledgeable than their higher-level counterparts.

4.2.1 Content knowledge

Content knowledge encompasses knowledge about students' career planning and career and study options. With a focus on the former, Myrick and Carrow (1987) found that half of the 248 teachers surveyed agreed that they knew career theories. In an exploration of the latter with 300 teachers, Fuller et al. (2014) revealed their limited awareness of the spectrum of career options

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1 Because the studies by Karacan Ozdemir et al. (2022) and Karacan Ozdemir and Aydın (2022) used the same sample, they were only counted once.

Identification of studies via databases

IDENTIFICATION

Total	**5100**
Eric	3623
PsycINFO	235
PSYNDEXplus	14
Web of Science	99
Scopus	185
FIS Bildung	944

Duplicates removed	**322**

TITLE & ABSTRACT SCREENING

Total	**4768**

Excluded by criteria	**4719**

Unavailable	**6**

FULL-TEXT SCREENING

Total	**43**

Excluded by criteria	**12**
Wrong publication type	5
Wrong focus	3
Duplicates	2
Language	2

STUDIES INCLUDED

Total	**31**
Quantitative studies	13
Qualitative studies	8
Mixed-methods studies	10

FIGURE 2
Flowchart of the literature search.

available to students; they were particularly unaware of vocational routes and local providers, and only half of the teachers were aware of apprenticeships.

4.2.2 Pedagogical-content knowledge

Only one study by Myrick and Carrow (1987) has examined teachers' knowledge about designing career planning activities. They found that half of the surveyed teachers agreed that they knew how to work with students about career planning.

4.2.3 Organizational knowledge

Organizational knowledge encompasses an understanding of how career guidance is integrated within the broader school framework and how teachers can effectively collaborate with other stakeholders. Myrick and Carrow (1987) found that less than half of 248 teachers were aware of their schools' career centers, while Modiba and Sefotho (2019) observed low networking skills among teachers in South Africa, suggesting a gap in organizational knowledge.

TABLE 3 Studies reviewed in this paper on teachers' competencies in school-based career guidance.

Author(s) (year)	Sample[a] size	Data sources	Country	Context	Key features
Quantitative					
Akos et al. (2011)	291	Survey	USA	Teachers[b]	Teachers' perspectives on career-education efforts in middle schools and the factors influencing them
Baker (1972)	79[c] (mixed)	Survey	USA	Vocational and academic teachers and community members	Attitudes of vocational and academic teachers and the general public toward career education
Billett et al. (2022)	296	Survey	Australia	VET teachers	VET teachers' views about factors influencing postschool pathways
Dodd and Hooley (2018)	526	Survey	UK	Teachers	Development of the Teachers' Attitudes toward Career Learning Index
Dreer and Kracke (2011)	135	Survey	Germany	Teachers	How teachers assess their colleagues' motivation and knowledge about career guidance
Gross and Kaplan (1975)	373[d] (mixed)	Survey	USA	Teachers and principals from elementary and intermediate schools	Teachers' and principals' attitudes toward the implementation of a new career-education curriculum
Krivas (1986)	503	Survey	Greece	Teachers in academic and vocational schools	Teachers' views and opinions on school guidance and counseling
Myrick and Carrow (1987)	248	Survey	USA	Teachers	Teachers' perceptions of their confidence, knowledge, and role in career education and advising
Nguyen Thi (2017)	115	Survey	Vietnam	Teachers	Assessment and training program on career-counselling skills for high-school teachers
Pershing and Demetropoulos (1981)	248	Survey	USA	Vocational teachers	Teachers' attitudes toward the importance and adequacy of career guidance in secondary schools
Resnick and Malyn-Smith (1979)	22[e] (mixed)	Survey	USA	Teachers	How teachers perceive the importance of competencies needed for the implementation of career education
Russell and Bailey (1982)	31	Survey	USA	Teachers	Teachers' perceptions of the appropriateness of the learner outcomes in career education
Smith (1982)	299[f] (mixed)	Survey	USA	Science teachers and education personnel in grades K–12	Teachers' and education personnel's attitudes toward and practice of career education in science teaching
Qualitative					
Draaisma et al. (2018)[g]	50	Interviews	Netherlands	Vocational teachers in vocational schools	Teachers' perceptions of the initial situation regarding career development in their schools
Irving (2009)	1	Interview	New Zealand	Teacher	How the concept of social justice is understood and located in career-education practice
Krei and Rosenbaum (2001)	80	Interviews	USA	Vocational teachers in high schools	Vocational teachers' practices of giving career and college advice to students unlikely to seek a 4-year college degree
Lindstrom et al. (2020)	47[h] (mixed)	Focus-group interviews	USA	Teachers and education personnel	Perspectives of teachers and education personnel regarding career- and college-preparation services and available support
Magee et al. (2022)	32	Interviews	Netherlands	Vocational teachers in vocational schools	Discourse among vocational teachers about career guidance and how it is understood
Mittendorff et al. (2008)	9	Interviews	Netherlands	Teachers in prevocational and vocational schools	Perspectives of teachers on the use of personal-development plans and portfolios in career guidance
Modiba and Sefotho (2019)	2	Interviews	South Africa	Life-orientation[i] teachers	Training needs of life-orientation teachers in teaching career guidance at rural high schools
Szeto (2022)	9	Interviews	China	Teachers	Teachers' perspectives on career and life-planning education through the theoretical lens of social cohesion

(Continued)

TABLE 3 (Continued)

Author(s) (year)	Sample[a] size	Data sources	Country	Context	Key features
Mixed-methods					
Dama et al. (2019)	18	Interviews, focus-group discussions, questaviews	South Africa	Life-orientation teachers	Efficacy of career guidance and counseling in high schools and teachers' experiences in offering it
Dixon (2001)	336[j] (mixed)	Repertory grid, survey, interviews	Australia	Teachers and education personnel	Teachers' and education personnel's personal construction of meaning in career and vocational education
Fuller et al. (2014)	300	Survey, follow-up interviews	UK	Teachers	Teachers' experiences of delivering career guidance and their knowledge and confidence in doing so
Karacan Ozdemir and Aydın (2022)[k]	45	Survey, open-ended questions[l]	Turkey	Teachers[m]	Teachers' perceptions of training through motivational interviews and their personal and professional development
Karacan Ozdemir et al. (2022)	48	Survey, focus-group interviews	Turkey	Teachers	Effectiveness of training program in fostering teachers' competencies in providing career-development learning
Munro (2007)	80	Survey, interviews	USA	Teachers	Teachers' perceptions of various career-guidance instruments in high schools
Olehnoviča and Kravale-Pauliņa (2008)	205	Survey, open-ended questions[n]	Latvia	Teachers from comprehensive and vocational schools	Teachers' needs in career education; part of a research project on sustainable education
Oppenheimer and Flum (1986)	355[o] (mixed)	Survey, interviews	Israel	Teachers from elementary and high schools	Teachers' attitudes and activities in career education
Osoro et al. (2000)	40	Survey, interviews	Kenya	Teachers	Teachers' opinions on how to improve the practice of career guidance in high schools
Watermeyer et al. (2016)	94	Survey, open-ended questions[p]	UK	Teachers in STEM domains	Science teachers' attitudes toward changes in the provision of career guidance

[a]If the sample includes individuals beyond teachers (e.g., principals, administrators) or teachers from different school levels, the study is labeled as *mixed*.
[b]This study encompasses teachers from the sixth and seventh grades. Given that these grade levels are considered part of secondary education in many countries, we have included it in our review.
[c]This sample included 22 academic teachers, 31 vocational teachers, and 26 members of the communities.
[d]This sample included 373 teachers and principals from elementary and intermediate schools.
[e]This study lacks information regarding the composition of the teacher sample.
[f]This sample included 230 science teachers and 69 science specialists, administrators, and others. The participants in the sample were involved in grades K–12, but the majority worked at the high-school level or at more than one level.
[g]Draaisma and colleagues published most of these findings in 2017 in the *British Journal of Guidance and Counselling*, so that earlier article is considered a duplicate and is not included in this review.
[h]This sample included 19 teachers and 28 other education personnel like administrators, counselors, and advisers.
[i]Life orientation (LO) was introduced as a compulsory subject in 1997 in South Africa. The goal was to empower students with knowledge and life skills to make meaningful choices regarding their careers and health (Modiba and Sefotho, 2019, p. 1). LO covers four domains: physical development, social development, career development, and well-being (Dama et al., 2019, p. 55).
[j]This sample included teachers and administrative staff.
[k]The studies by Karacan Ozdemir et al. (2022) and Karacan Ozdemir and Aydın (2022) use the same sample. To avoid redundancy, the results on self-efficacy reported in both articles were exclusively coded from the study by Karacan Ozdemir et al. (2022).
[l]The research data were analyzed both qualitatively and quantitatively, with descriptive analysis applied to open-ended questions.
[m]Since middle school in Turkey encompasses the seventh and eighth grades—grades that are considered part of secondary education in many countries—this study has been included in the sample.
[n]The research data were analyzed in both qualitative and quantitative ways.
[o]The sample included 355 teachers from elementary schools (40%) and high schools (60%). It should be noted that elementary school in Israel encompasses the first to eighth grades and high school ninth to twelfth.
[p]The research data were analyzed in both qualitative and quantitative ways, with grounded theory applied to one open question.
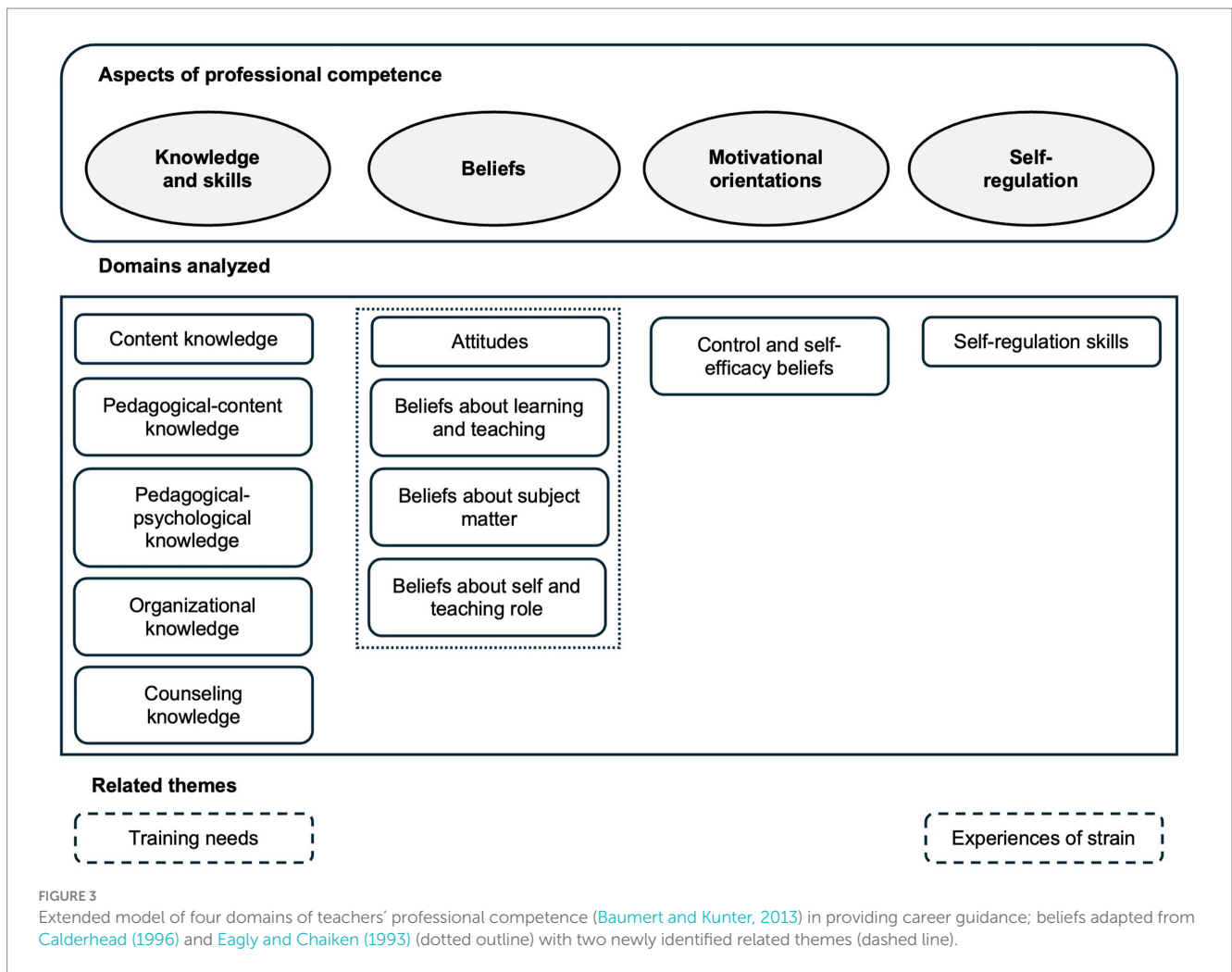
4.2.4 Counseling knowledge

In a study on the career-counseling skills of 115 Vietnamese teachers, Nguyen Thi (2017) distinguished between basic (e.g., relationship building, questioning, feedback) and particular counseling skills (e.g., working in groups, analyzing information). Teachers rated their basic skills positively and no skill below satisfactory, but they showed lower ratings for their counseling skills. A training course improved particular counseling skills for 30 participants. In contrast, Karacan Ozdemir et al. (2022) found no improvement in communication skills among 48 Turkish teachers after a training program.

4.2.5 Training needs

To conclude the findings on teachers' knowledge and skills, we also looked at their training needs in career guidance, which are depicted as related themes in the extended professional-competence

FIGURE 3
Extended model of four domains of teachers' professional competence (Baumert and Kunter, 2013) in providing career guidance; beliefs adapted from Calderhead (1996) and Eagly and Chaiken (1993) (dotted outline) with two newly identified related themes (dashed line).

model in Figure 3. Research has indicated that teachers agree that they need further training and information (Smith, 1982; Myrick and Carrow, 1987; Osoro et al., 2000; Fuller et al., 2014; Nguyen Thi, 2017). Olehnoviča and Kravale-Pauliņa (2008) surveyed 205 Latvian teachers regarding their educational needs concerning students' career development. The teachers exhibited a strong preference for theoretical knowledge over practical skills, suggesting a lack of emphasis on theoretical knowledge in teacher education. According to Smith (1982), science teachers need information about objectives, materials, techniques, and careers related to their subject area and the world of work to incorporate career education into their courses. Qualitative data offer insights into additional training needs, including vocational and higher-education options, employer perspectives (Fuller et al., 2014), labor-market trends (Olehnoviča and Kravale-Pauliņa, 2008), computer-literacy skills to aid learners with online applications (Modiba and Sefotho, 2019), increased dialogue about career guidance (Magee et al., 2022), and more training options and feedback (Draaisma et al., 2018).

4.3 RQ2: teachers' attitudes and beliefs

While 11 studies referred to a concept of attitudes, none explicitly formulated a research question referring to the concept of beliefs. Five

studies mentioned beliefs when presenting results (Mittendorff et al., 2008; Irving, 2009; Watermeyer et al., 2016; Karacan Ozdemir and Aydın, 2022; Karacan Ozdemir et al., 2022). However, a substantial number of studies analyzed teachers' perceptions or views on specific aspects of career guidance.

4.3.1 Teachers' attitudes toward career guidance

Eleven studies assessed teachers' attitudes toward school-based career guidance, employing both quantitative (9) and qualitative (3) methods. The quantitative research predominantly utilized questionnaires to examine attitudes toward various aspects of career guidance; these studies exhibited heterogeneity in the construction of attitudinal items. Two studies developed and evaluated instruments to assess attitudes toward career guidance (Smith, 1982; Dodd and Hooley, 2018).

The majority of studies (9) on teachers' attitudes toward school-based career guidance reported positive perceptions (Baker, 1972; Gross and Kaplan, 1975; Pershing and Demetropoulos, 1981; Smith, 1982; Oppenheimer and Flum, 1986; Myrick and Carrow, 1987; Akos et al., 2011; Dodd and Hooley, 2018). However, one study identified predominantly negative attitudes among STEM teachers toward the UK's policy of integrating career guidance into schools (Watermeyer et al., 2016). Additionally, six studies examined moderation in teachers' attitudes toward career guidance by gender, age, years of

TABLE 4 Coded domains and related themes.

Author(s) (year)	Knowledge and skills	Beliefs				Motivational orientation	Self-regulation	Related themes	
	CK, PCK, PK, OK, CoK[a]	Attitudes	Learning and teaching	Subject matter	Self and role	Self-efficacy, confidence	Self-regulation skills	Training needs	Strains
Akos et al. (2011)		X[b]							
Baker (1972)		X							
Billett et al. (2022)			X						
Dama et al. (2019)		X	X	X					X
Dixon (2001)		X		X					
Dodd and Hooley (2018)		X			X				
Draaisma et al. (2018)			X			X		X	X
Dreer and Kracke (2011)	X								
Fuller et al. (2014)	X		X		X	X		X	X
Gross and Kaplan (1975)	X	X[c]							
Irving (2009)			X		X				
Karacan Ozdemir and Aydın (2022)				X					
Karacan Ozdemir et al. (2022)	X					X			
Krei and Rosenbaum (2001)					X	X			X
Krivas (1986)					X				
Lindstrom et al. (2020)			X						X
Magee et al. (2022)				X	X			X	X
Mittendorff et al. (2008)			X						X
Modiba and Sefotho (2019)	X							X	
Munro (2007)			X		X				X
Myrick and Carrow (1987)	X	X			X	X		X	
Nguyen Thi (2017)	X							X	
Olehnoviča and Kravale-Pauliņa (2008)								X	
Osoro et al. (2000)			X					X	X
Oppenheimer and Flum (1986)		X[d]		X	X				
Pershing and Demetropoulos (1981)		X[e]							
Resnick and Malyn-Smith (1979)					X				
Russell and Bailey (1982)				X					
Smith (1982)		X[f]		X				X	X
Szeto (2022)			X						X
Watermeyer et al. (2016)		X		X	X				X
Total	7	11	10	8	11	5	0	9	12

[a]CK = content knowledge, PCK = pedagogical-content knowledge, PK = pedagogical-psychological knowledge, OK = organizational knowledge, CoK = counseling knowledge.
[b]Also factors influencing teachers' perspectives, including gender, subject, and school type.
[c]Also factors influencing teachers' attitudes, including years of experience and grade taught.
[d]Also factors influencing teachers' attitudes, including grade level, subject, teachers' level of education, and school type.
[e]Also factors influencing teachers' attitudes including gender, age, type of teacher certification, years of experience, and guidance system.
[f]Also factors influencing teachers' attitudes including grade level, subject, teachers' level of education, and years of experience.

teaching experience, grade taught, or subject taught (Baker, 1972; Gross and Kaplan, 1975; Pershing and Demetropoulos, 1981; Smith, 1982; Oppenheimer and Flum, 1986; Akos et al., 2011). Qualitative findings indicated that teachers' attitudes toward career guidance are influenced by school conditions (Dixon, 2001; Dama et al., 2019) and teachers' own career satisfaction or dissatisfaction (Oppenheimer and Flum, 1986).

4.3.2 Teachers' beliefs about learning and teaching in career guidance

In the domain of teachers' beliefs about learning and teaching in career guidance, three subcategories emerged through inductive content analysis. The results of six studies were coded to the subcategory "family influence and expectations." They examined teachers' perspectives on how families impact the career planning process. Two studies indicated that when presented with a list of potential factors, teachers considered family the most significant factor influencing career choices (Munro, 2007; Billett et al., 2022). Conversely, when questioned about the key contributors to career guidance, teachers ranked subject teachers and school career advisers higher than parents (Fuller et al., 2014). The qualitative findings highlighted teachers' concerns about parental expectations, noting negative impacts, such as pressure to pursue unwanted or unsuitable educational paths (Osoro et al., 2000; Dama et al., 2019). A small-scale qualitative study from New Zealand emphasized potential conflicts in beliefs, such as the dilemma teachers face in trying to remain impartial regarding parents' cultural expectations when they believed that individual students should be free to choose their own paths (Irving, 2009). Lindstrom et al. (2020) emphasized the influence of family circumstances on career planning. Through focus-group discussions with 47 teachers and education personnel[2], they found the shared belief that daily challenges like poverty or unstable family environments impact the ability of underserved youth to learn or benefit from college- and career-readiness programs.

The outcomes of five studies were categorized under "significant learning activities." They focused on teachers' perspectives regarding relevant activities in students' career-planning process. Fuller et al. (2014) found that teachers highly valued employer visits and taster days for aiding positive decision-making. Qualitative studies (Munro, 2007; Draaisma et al., 2018; Dama et al., 2019; Lindstrom et al., 2020) supported this, emphasizing the importance of exposing students to career opportunities through field trips to local businesses, career exhibitions, college tours, and real-life work experience. As an interview participant noted: "These exhibitions help them get information from the horse's mouth, instead of relying on what we teach them in class" (Dama et al., 2019, p. 59). However, there were concerns that students misuse activities like job shadowing to skip school (Munro, 2007).

Limited focus was placed on teachers' beliefs regarding teaching "methods, strategies, instruments" in the examined studies; only three addressed this. Mittendorff et al. (2008) explored the divergent views

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2   We use the term "teachers and education personnel" when a study's sample includes not only teachers but also other educational staff such as instructional assistants, counselors. Specialist or principals. Studies with mixed samples are indicated in Table 3.

of vocational teachers regarding portfolios and personal career-development plans. Some teachers believed that it is essential to combine portfolios with personal conversations and an investment in the relationship to the student, while others believed that the assignments in the portfolios are sufficient. Similarly, in a study by Lindstrom et al. (2020), interviewed teachers and education personnel identified strategies like fostering connections with trusted adults and providing career-related learning experiences as important ways that positive relationships can guide career-planning processes. Recent research from China (Szeto, 2022) has highlighted teachers' recognition of the significance of aligning personalized career guidance with students' abilities and interests.

4.3.3 Teachers' beliefs about career guidance as a subject matter

In the domain of teachers' beliefs about career guidance as a subject matter, two subcategories emerged through inductive content analysis. The results of five studies were coded to the subcategory "understanding and objectives," which addresses teachers' assumptions about the meaning and objectives of career guidance. Smith's (1982) survey revealed that science teachers and education personnel do not equate career education with vocational education. However, the qualitative research (Oppenheimer and Flum, 1986; Magee et al., 2022) exposed teachers' struggles to grasp the concept fully. A recent interview study by Magee et al. (2022) found that the 32 vocational teachers involved had varying views about career guidance and often did not differentiate between educational, vocational, and career guidance, indicating a stagnation of sense-making at the level of assimilation and a lack of accommodation of the comprehensive concept of career guidance. Additionally, Oppenheimer and Flum (1986) noted that teachers tried to assimilate the new concept of career education into existing schemes, some interpreting it as fostering good work habits or directing students toward suitable further study or work paths. Karacan Ozdemir and Aydın (2022) showed that motivational interviewing training can change teachers' views; posttraining interviews indicated a shift toward seeing career counseling as empowering students to choose their own path rather than directing them toward a specific direction. Dixon (2001) explored the meanings teachers and education personnel constructed for career and vocational education, finding that they viewed it in terms of real-life relevance, curriculum structure, and their teaching philosophy. This often led to confusion due to its mismatch with familiar curriculum structures. Two American studies from the 1980s indicated that teachers considered predetermined career-education objectives important (Russell and Bailey, 1982; Oppenheimer and Flum, 1986).

The qualitative results of three studies were coded to the subcategory "status within the school." The findings indicated that teachers assigned lower status to career-related courses and assignments, either because they viewed career guidance as an additional task rather than a core pedagogical priority (Dixon, 2001; Watermeyer et al., 2016) or due to inadequate teaching conditions (Dama et al., 2019).

4.3.4 Teachers' beliefs about themselves and their own roles in career guidance

In the domain of teachers' beliefs about themselves and their own role in career guidance as a subject matter, two subcategories emerged

through inductive content analysis. Nine studies in the subcategory "teachers' role and responsibilities" found that teachers perceived their role in career guidance differently. While the quantitative research suggested that teachers viewed themselves as having a certain role in students' career development (Oppenheimer and Flum, 1986; Myrick and Carrow, 1987; Fuller et al., 2014; Dodd and Hooley, 2018), qualitative insights showed varying perceptions from informal to formal responsibilities (Munro, 2007; Fuller et al., 2014; Watermeyer et al., 2016). Vocational teachers saw career guidance as a key part of their job (Magee et al., 2022), but general teachers viewed it as part of their broader supportive role and not as a central teaching element (Dodd and Hooley, 2018). In a survey of 94 general science teachers, Watermeyer et al. (2016) found that a third were ready to assume responsibility for providing STEM-career guidance due to relational proximity with students, insight into students' abilities, or self-identification as a STEM ambassador. Other qualitative findings underscored that teachers' relationship with students and knowledge about their backgrounds, abilities, and aspirations justify their involvement in career guidance (Fuller et al., 2014). Conversely, dissenting teachers have raised concerns about potential biases due to close relationships, outdated information, and limited resources (Watermeyer et al., 2016). Similarly, Fuller et al. (2014) found that some teachers felt unprepared and hesitant about providing career guidance due to their reliance on their own outdated experiences. The idea that teachers' professional identities as career educators is shaped not only by official guidelines but also by personal experiences and their biographical backgrounds was examined in a case study by Irving (2009). Additionally, Krivas's (1986) quantitative study of 503 Greek teachers found that self-perception influenced their involvement in career guidance; those who saw themselves as "educators" were more willing than those who identified as "knowledge disseminators." Krei and Rosenbaum (2001) identified four roles among 80 vocational teachers regarding providing career guidance: "diplomats" balance encouragement with realism, "straightforward" teachers offer realistic advice, "hands-off" teachers avoid involvement in future planning, and "college-for-all" advocates promote college for all students.

The results of three studies coded to the subcategory "required teachers' competence" revealed that teachers prioritized personal-pedagogical qualities and general coaching skills, including asking questions and active listening, as essential for providing career guidance (Resnick and Malyn-Smith, 1979; Krivas, 1986; Magee et al., 2022).

To summarize teachers' attitudes and beliefs toward career guidance, teachers generally hold positive attitudes toward school-based career guidance. They see family as a critical, though sometimes restrictive, influence on students' career choices. Teachers also believe that hands-on experiences, such as employer visits and work experiences, are essential for helping students explore career options. However, teachers hold varied and often limited views on career guidance itself and have diverse perceptions of their roles in it, shaped by personal experience, self-perception, and perceived competence.

4.4 RQ3: motivational orientation

Five studies coded to the category "control and self-efficacy beliefs" demonstrated that while most teachers felt confident in

providing career guidance (Myrick and Carrow, 1987; Fuller et al., 2014), their confidence diminished when delivering information, advice, and guidance beyond their specialization and experience (Fuller et al., 2014). The qualitative evidence highlighted that vocational teachers' confidence came from up-to-date professional knowledge and employer connections, which surpassed that of guidance counselors (Krei and Rosenbaum, 2001). Karacan Ozdemir et al. (2022) and Draaisma et al. (2018) studied the impact of training programs on teachers' confidence in career guidance. The former used a pretest–posttest design to evaluate a training intervention and found increased self-efficacy in 48 teachers after training on topics like career development and motivational interviewing. Draaisma et al. reported (2018) that vocational teachers felt more confident in career dialogues after training, though some found it hard to express how their skills had improved.

4.5 RQ4: self-regulation skills

None of the 31 studies provided direct results on teachers' self-regulation skills in managing their resources in school-based career guidance. However, according to Baumert and Kunter (2013), research on the experience of strain and challenging work situations is relevant to the aspect of self-regulation, as these factors can affect teachers' self-regulation skills. Understanding which areas of their work teachers find particularly demanding is a first step toward exploring how they cope with these demands. Therefore, within this review, it seemed valuable to document which specific aspects teachers perceive as stressful in the context of career guidance as a related theme. While we did not find specific results on teachers' self-regulation skills, we can at least identify and discuss areas of strain in career guidance. These have been depicted as a related theme in the extended professional-competence model in Figure 3 and are further described below.

4.5.1 Teachers' experience of strain

A total of 15 studies reported on teachers' experiences of strain and challenges related to career guidance. Some of the most prevalent challenges were related to a lack of resources, such as time or capacity (Smith, 1982; Mittendorff et al., 2008; Fuller et al., 2014; Watermeyer et al., 2016; Draaisma et al., 2018), or deficiencies in infrastructure (Dama et al., 2019) and information materials (Watermeyer et al., 2016). Other challenges were related to working conditions, including insufficient support from schools or state authorities (Smith, 1982; Osoro et al., 2000; Fuller et al., 2014; Watermeyer et al., 2016), limited access to career-guidance training (Watermeyer et al., 2016; Dama et al., 2019), a lack of shared understanding or information within the school (Munro, 2007; Draaisma et al., 2018), and high teacher turnover (Dama et al., 2019). Magee et al. (2022) found that school-leadership styles posed a challenge; teachers were divided between wanting autonomy and desiring structured support, clear expectations, and guidance. Several studies identified challenges in delivering career-related support, including limited parental involvement (Munro, 2007; Dama et al., 2019), parental preferences concerning school education (Krei and Rosenbaum, 2001), and concerns regarding influencing students' choice of subjects (Dama et al., 2019). Teachers also articulated concerns regarding students' circumstances, including their career development beyond secondary education

(Szeto, 2022), challenging home environments, and the inadequacy of career-preparation experiences (Lindstrom et al., 2020).

4.6 Summary

To address RQ1, results related to teachers' knowledge were identified in seven studies, revealing significant gaps across all domains of professional knowledge about career guidance. Furthermore, nine studies highlighted a need for additional training and information.

Regarding RQ2, 26 studies reported findings related to teachers' attitudes and beliefs, indicating that teachers generally held a positive attitude toward school-based career guidance. Findings related to teachers' beliefs emphasized the importance they placed on the central role of family in students' career planning and the significance of providing students with direct exposure to a variety of career opportunities for making informed choices. Furthermore, the results indicated that teachers struggled to fully comprehend the concept of career guidance; they often interpreted it through familiar frameworks rather than recognizing its overall significance. Research on teachers' beliefs about their roles in career guidance revealed a range of viewpoints, from informal to formal engagement.

Regarding RQ3, five studies reported findings on teachers' confidence in engaging with students in school-based career guidance, indicating that teachers generally exhibited confidence, although this was closely related to their specialization and experience. Training programs aimed at boosting self-efficacy showed positive results.

Regarding RQ4, none of the studies specifically addressed teachers' self-regulation skills, although 12 studies highlighted challenges such as limited resources, inadequate institutional support, and difficulties in delivering career-related support.

5 Discussion

This systematic review based on 31 studies is the first to summarize teachers' competencies in school-based career guidance. As career guidance has become increasingly important in schools due to the need to prepare adolescents for an even more complex world of work (OECD, 2004), regular teachers have taken on more significant roles in these efforts, contributing to varying extents (Hearne and Galvin, 2015; Hooley et al., 2015; Kuijpers and Meijers, 2017). This underscores the necessity of understanding the essential competencies required for teachers to contribute to effective career guidance. In our review, we adopted Baumert and Kunter's (2013) professional-competence model as a guiding framework and identified two related themes that expanded the model. The analysis indicated that a substantial number of studies (26) have focused on teachers' attitudes and beliefs. In contrast, fewer studies have examined knowledge and skills (7) or motivational orientation (5), the latter defined in terms of self-efficacy beliefs. Notably absent was research addressing teachers' self-regulation. A closer examination of the comparatively high number of findings on attitudes and beliefs revealed two main observations. First, since the 1970s, quantitative research on teachers' attitudes toward career guidance has increased in the United States, a trend linked to the period's introduction of career education as a component of education reform (Hoyt, 1977). Second, the operationalization of attitudes and beliefs across studies varied

significantly and lacked a theoretical underpinning. In particular, the theoretical modeling of beliefs conducive to effective career guidance by teachers remains a substantial gap in the literature. The absence of theoretical modeling applies not just to beliefs but to all areas of professional competence in career guidance. Theoretically and empirically, there is a limited understanding of the professional knowledge, constructive beliefs, appropriate motivational orientations, and adequate self-regulation that teachers need to contribute to effective career guidance. It is also important to note that the organization of school-based career guidance is highly dependent on national educational policies and, as such, varies contextually. The roles, responsibilities, and training received by teachers differ across countries (Watts and Sultana, 2004; Pham et al., 2024). Consequently, these contextual differences must be taken into account when modeling teacher competencies in career guidance. Different competencies are required, for instance, when teachers are expected to deliver career-related information as part of a subject or to support students in their career-planning process within their broader general supportive role. Initial efforts to model competencies for teachers with broader responsibilities in career guidance have been made, particularly in German-speaking regions (Dreer and Weyer, 2020). Modeling teachers' professional competence in career guidance is vital, as such models serve as foundations for both empirical research and systematic training in teacher education.

Our review highlights that teachers generally have positive attitudes toward school-based career guidance and see themselves as having a role in it. However, it also reveals significant gaps in knowledge and skills, with teachers expressing a need for further training. This suggests that teacher education must incorporate specific courses on career guidance, tailored to the contextual requirements of the career guidance setting. As Watts and Sultana (2004) emphasize, many countries increasingly aim for career guidance in schools to not only help students with immediate choices but also lay a foundation for lifelong learning and continuous career development. To achieve this, teachers need to understand these broader goals and be equipped with the necessary knowledge and skills to support them. In teacher training, it is therefore essential to help teachers develop a clear understanding of their roles and responsibilities in career guidance within their specific educational system. Training should also address potential tensions that may arise between teachers' primary roles as subject teachers and their roles in career guidance (Mittendorff et al., 2011; Dreer and Weyer, 2020; Stalder et al., 2023). Reflection on the specific roles teachers take in career guidance, along with the challenges associated with these roles, should be an integral part of teacher education. Alongside courses for pre-service teachers, training programs for in-service teachers are also important, as they address the ongoing professional development needs of practicing teachers. These programs are particularly valuable, as they have been shown to enhance teachers' confidence and self-efficacy in career guidance (Draaisma et al., 2018; Karacan Ozdemir et al., 2022). Such courses and professional development programs can be built on previous research findings in our review concerning knowledge, attitudes/beliefs, and motivational variables. However, due to the limited research on self-regulation in career guidance among teachers, future studies on this topic are urgently needed before self-regulation suggestions can be effectively integrated into teacher education.

Our review also reveals that teachers encounter numerous challenges in career guidance, including limited resources and time.

Additionally, teachers face a variety of demands and expectations that may conflict with each other, such as divergent career expectations between students and parents or the need to support individual student processes while also meeting system-oriented outcomes (Hughes et al., 2017; Stalder et al., 2023). These conditions can lead to considerable strain on teachers. Addressing the issue of teacher strain cannot be limited to teacher education but must also be approached at the system level. National educational policies need to consider how career guidance is structured within the school context and determine effective ways to involve teachers. Approaches that frame career guidance as a collaborative, multi-professional responsibility—involving frontline teachers, counselors, career specialists, school principals, and external stakeholders—may be particularly promising (Hughes et al., 2017; Hearne and Neary, 2021; Parola et al., 2024). In Switzerland, for example, career guidance is a collaborative effort involving divers stakeholders, both within and outside the school, who work toward a shared goal, each with distinct and clearly defined roles and responsibilities (Kamm et al., 2020; Stalder et al., 2023).

As mentioned in the introduction, teachers play an important role in their students' career-planning process, even when they are not explicitly assigned tasks and responsibilities in this area (Song et al., 2022; Wong et al., 2023). Our review clearly showed that teachers have a positive attitude toward this supportive role. Accordingly, it is advisable that teachers develop an awareness during their training of the vital role they play, for example, through their career-related emotional support in their students' school-to-work transition. Overall, our findings emphasize the importance of equipping teachers with competencies, to support students in their career-planning process. Addressing these challenges requires a concerted effort from researchers, policymakers, and teacher educators alike.

5.1 Limitations

This review has limitations, including a narrow focus on English- or German-language studies. Despite the authors' comprehensive search across various databases and efforts to minimize publication bias by including a wide array of publication criteria, it is possible that pertinent studies were overlooked.

6 Conclusion

This systematic review provides comprehensive insights into the empirical evidence on teachers' competencies in career guidance. By employing the professional-competence model as a guiding framework, our analysis identified significant research gaps, including the direct and

valid measurement of knowledge, the assessment of self-regulation, and the theoretical modeling of teachers' beliefs. The findings highlight the pressing need for theoretical modeling of teachers' professional competence in career guidance and call for further systematic research. Our extended model of teachers' professional competence provides a foundation for subsequent discussions and research on how comprehensive teacher training can enable teachers to be better prepared for the diverse tasks in the field of school-based career guidance.

Data availability statement

The original contributions presented in the study are included in the article/supplementary material, further inquiries can be directed to the corresponding author.

Author contributions

CJ: Conceptualization, Data curation, Investigation, Methodology, Project administration, Visualization, Writing – original draft, Writing – review & editing, Formal analysis. SM: Conceptualization, Methodology, Supervision, Writing – review & editing. CH: Formal analysis, Validation, Writing – review & editing. AD: Conceptualization, Supervision, Writing – review & editing.

Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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