

Self-Efficacy Scales: Systematic Literature Review

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Since its definition by Bandura, self-efficacy has been an important topic of investigation for psychology and several other areas of knowledge. The major means of investigating this construct is through the use of scales that aim to measure self-efficacy. Therefore, the objective of the present study is to carry out a systematic review to identify which scales and what types of psychometric evidence are available regarding the measurement of self-efficacy. To assist in the review process, ASReview was used, which demonstrated potential in streamlining the process. Through a systematic review of international literature, it was possible to identify 63 relevant publications and analyze the self-efficacy scales used, as well as their validity evidence.

Keywords: literature review, self-efficacy, scales, machine learning

Escala de autoeficácia: Revisão sistemática de literatura

Desde sua definição por Bandura, a autoeficácia é um importante tópico de investigação para a psicologia e diversas outras áreas de conhecimento. O principal meio de investigação de tal construto é a partir da utilização de escalas que visam mensurar a autoeficácia. Em vista disso, o objetivo do presente estudo consiste em realizar uma revisão sistemática para identificar quais escalas e que tipo de evidências psicométricas existem acerca da mensuração da autoeficácia. Para auxiliar no processo de revisão, foi utilizado o ASReview, o qual demonstrou potencial em agilizar o processo. Por meio da revisão sistemática da literatura internacional foi possível identificar 63 publicações relevantes e analisar as escalas de autoeficácia utilizadas, bem como suas evidências psicométricas.

Palavras-chave: revisão de literatura, autoeficácia, escalas, aprendizagem de máquina

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Escalas de autoeficacia: revisión sistemática de literatura

Desde su definición por Bandura, la autoeficacia ha sido un importante tema de investigación para la psicología y varias otras áreas del conocimiento. El principal medio para investigar este constructo es mediante el uso de escalas que tienen como objetivo medir la autoeficacia. Ante esto, el objetivo del presente estudio es realizar una revisión sistemática para identificar qué escalas y qué tipo de evidencia de validez existen respecto a la medición de la autoeficacia. Para ayudar en el proceso de revisión, se utilizó ASReview, que demostró potencial para simplificar el proceso. A través de una revisión sistemática de la literatura internacional, fue posible identificar 63 publicaciones relevantes y analizar las escalas de autoeficacia utilizadas, así como su evidencia de validez.

Palabras clave: literatura de revisión, autoeficacia, escalas, aprendizaje automático

Self-efficacy can be considered one of the most prominent phenomena studied in Work and Organizational Psychology (WOP) due to its role in the motivation and regulation of behavior in work environments. Studies highlighting the importance of this phenomenon for advancing research in educational, health, work, and business settings are not recent (Bandura, 1997). The importance of studying self-efficacy across different fields stems from its association with other variables that are highly relevant in Western societies, such as achievement and performance (Gecas, 1989).

As one of the central elements of Bandura's (1997) Social Cognitive Theory, self-efficacy is defined as personal beliefs regarding one's ability to perform specific actions and produce desired outcomes. The literature suggests that performance on a task is influenced by the level of confidence individuals have in their ability to perform it (Bandura & Locke, 2003). Thus, if individuals do not believe in their capacity to produce the expected results, they have little incentive to act or persist in the face of barriers encountered throughout an activity. It is important to note that self-efficacy is also a dynamic construct, as judgments may change over time as individuals acquire new information (Meneses & Abbad, 2010).

Consequently, self-efficacy regulates human behavior through cognitive, motivational, and decisional processes (Bandura, 1997). It involves the gathering of information, as well as the development and testing of strategies and behaviors aimed at achieving desired outcomes. Grounded on this definition, self-efficacy can be understood as involving two processes. The first refers to expectations and beliefs that certain behaviors lead to certain consequences. The second refers to beliefs regarding one's ability to perform the specific behaviors necessary to achieve desired outcomes (Eccles & Wigfield, 2002).

Additionally, authors such as Meneses and Abbad (2010) emphasize other important aspects involved in the definition of self-efficacy. One of these is the understanding of performance in a specific task, as information about the individual, task characteristics, and the work context may provide more accurate indicators of individual performance. From this perspective, self-efficacy is no longer viewed as a trait that individuals possess, but rather as a state. Accordingly, self-efficacy is understood as domain-specific and can only be assessed through perceptions that vary according to the activities involved and the context in which they are performed, rather than as a general disposition.

In light of this, the scientific literature encompasses a wide range of studies aimed at investigating not only general self-efficacy but also self-efficacy in specific domains. This is grounded on the premise that self-efficacy is not a stable trait possessed by individuals; therefore, the use of instruments designed to measure perceptions of efficacy regarding specific behaviors and their outcomes is considered more valid (Bandura, 1977). Studies can be found on academic self-efficacy (Huamán-Tapia et al., 2023), teacher self-efficacy (Hettinger et al., 2023), mathematics self-efficacy (Kaskens et al., 2020), and various other specific tasks.

These investigations are also not limited to the field of Psychology. Self-efficacy is an important object of study within the broader organizational context, including research conducted in fields such as nursing and education. In nursing, for example, the focus has been on investigating how self-efficacy affects nurses' ability to cope with the challenges and difficulties of the hospital environment, as well as their mental health, resilience, and willingness to care for patients with various illnesses (Lee & Kang, 2020; Xiong et al., 2020). A review of this literature reveals the use of instruments such as the Chinese version of the General Self-Efficacy Scale to assess nurses' confidence in the face of COVID-19 (Xiong et al., 2020), as well as the Nurses' Intention to Care for Patients with Severe Acute Respiratory Syndrome Scale (Lee & Kang, 2020).

Another example is research investigating self-efficacy in educational settings (Cheng et al., 2019). Such studies address teachers' ability to successfully plan and deliver instructional activities in specific contexts (Wray et al., 2022), as well as students' perseverance throughout the learning process and their ability to plan for and manage different obstacles (Cheng et al., 2019). The literature on self-efficacy in educational settings indicates that higher levels of self-efficacy among students are associated with a greater ability to cope with academic difficulties, enabling them to face a variety of situations and challenges (Cheng et al., 2019). Among teachers, studies highlight the importance of training and other developmental practices to foster self-efficacy for educational practices, such as inclusive education practices, for example (Wray et al., 2022). These findings were made possible through analyses of data collected using instruments such as the Postgraduate Students' Academic Self-Efficacy Scale (Cheng et al., 2019) and the Teachers' Sense of Efficacy Scale (Tschannen-Moran & Woolfolk Hoy, 2001).

The literature also indicates that self-efficacy varies significantly, even though there is evidence supporting the relationship between specific domains and a higher-order factor, namely general self-efficacy (Stojanovic et al., 2021). Evidence of weak to moderate correlations between general self-efficacy and domain-specific self-efficacy can be found in the specialized literature (Chen et al., 2001). Studies indicate that domain-specific self-efficacy is more sensitive to individuals' familiarity with a given task. Therefore, when individuals are aware of whether they possess the skills necessary to perform an activity, a self-efficacy measure targeting a specific domain may be more effective than a general self-efficacy measure (Wang & Richard, 1988).

The literature indicates that self-efficacy is a fundamental concept for understanding individuals' career development and work-related experiences, showing significant associations with career decision-making (Lent, 2013), career adaptability (Monteiro et al., 2020), and

employability (Römgens et al., 2020). Given the importance of this construct to Western society and its applicability within organizations, conducting a systematic review of existing measurement instruments focused on self-efficacy in organizational and work contexts is considered important from the perspective of Work and Organizational Psychology (WOP), using Social Cognitive Theory (Bandura, 1997) as the conceptual framework for defining the construct. Through the conduct of systematic reviews, it is possible to draw conclusions, grounded on levels of certainty, confidence, and consistency, regarding what is known and unknown about a topic delimited by the formulated research question (Briner & Denyer, 2012).

In light of this, the aim of the present study is to conduct a systematic review to identify which scales and what types of psychometric evidence are available regarding the measurement of self-efficacy in organizational and work contexts. Furthermore, the study seeks to synthesize the literature concerning evidence related to both general self-efficacy scales and domain-specific self-efficacy scales. The specific objectives are: (1) to identify which general and domain-specific self-efficacy scales are used in organizational and work contexts; and (2) to identify the psychometric evidence available for these scales. Grounded on this synthesis, the study is expected to contribute to the effective selection of instruments for both research and interventions focused on work and career issues. Consequently, it is also expected to contribute to a better understanding of the self-efficacy construct and its relationship with other constructs associated with the world of work, helping to address gaps in the literature concerning work- and career-related phenomena among individuals in organizational contexts.

Method

Search Strategy

The review followed the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) guidelines. In October 2023, searches were conducted in the Web of Science, PsycInfo, Scopus, Medline, and ERIC databases, which traditionally index research in the fields of health, psychology, psychiatry, and education. These fields were selected because they were found to contain the highest volume of publications employing self-efficacy scales in organizational and work-related contexts. Searches were limited to article titles, abstracts, and keywords using the following search strategy and Boolean operators: (“self efficacy” OR “self-efficacy”) AND (“workplace” OR “organization*” OR “work”) AND (“Self efficacy scale” OR “Self-Efficacy scale” OR “Self efficacy test” OR “Self-efficacy test” OR “Self efficacy questionnaire” OR “Self-efficacy questionnaire”) AND (“Psychology”). Filters were also applied to restrict results to peer-reviewed scientific articles. Publication year limits were established, restricting the search to articles published between 2013 and 2023, given that organizational and work contexts change rapidly and this study seeks to analyze and compare evidence regarding more recently developed and validated self-efficacy scales.

The following inclusion criteria were adopted: (1) research articles; (2) studies employing empirical and quantitative methodologies; (3) studies investigating either general self-efficacy or domain-specific self-efficacy; (4) studies using scales to assess the self-efficacy construct; (5) studies addressing contexts within psychology, health, or education; and (6) studies involving samples of adult participants. Articles were excluded if they: (1) involved highly specific samples or research contexts; (2) had unavailable full texts; or (3) consisted of strictly conceptual or theoretical articles or publications.

Selection of the Review Corpus

Initially, the results obtained through the search strategy were grouped, and duplicate articles were removed. From this initial set, article titles, abstracts, and keywords were analyzed to select studies for the eligibility assessment stage. Articles that advanced to the eligibility assessment were reviewed in full and subsequently included or excluded from the review corpus.

The ASReview software was used to support the selection process of the review corpus. The tool employs a machine learning algorithm to classify articles according to their relevance to the eligibility criteria through a text-mining process. This artificial intelligence tool offers several classification models through which researchers can determine the relevance of the included articles (Van de Schoot et al., 2021). For study screening using ASReview, a stopping criterion was established in advance after the evaluation of a considerable number of relevant studies identified consecutively, as recommended by van Haastrecht et al. (2021).

The objective of the screening process is to identify relevant articles (R) within a given body of literature (N). However, the total number of relevant articles is always unknown. To estimate this number, a fraction $F = 0.1$ of all studies selected for the screening stage was randomly sampled. Among these articles, r relevant articles and i irrelevant articles were identified ($r + i = F \times N$). Thus, R can be estimated as:

$$R \approx N \times \frac{r}{r + i}$$

Once an estimate of the number of relevant articles (R) within a review corpus has been obtained, a stopping criterion can be established based on identifying the estimated number of relevant articles (R). Additionally, to prevent a scenario in which the randomly selected fraction contains an unexpectedly small number of relevant articles, an additional stopping criterion may be established by identifying a number of consecutively irrelevant articles equal to 15% of N . The adoption of a more stringent stopping criterion is important because

it helps determine the appropriate point at which to discontinue the initial screening stage without overlooking studies that may still be relevant to the stated research objective.

Data Extraction

Information was extracted from the articles to address the questions posed by this systematic review. To enable a better understanding of the differences among self-efficacy measurement instruments and their findings, information was extracted regarding: (1) the scales used; (2) the psychometric evidence of the instruments; and (3) the limitations of the studies. In addition, information was also extracted regarding (4) the research context, (5) the number of participants, and (6) the sociodemographic characteristics of the samples.

Synthesis

To synthesize the main information extracted from the reviewed articles, the self-efficacy scales were categorized according to their approach to the variable, namely whether they assessed a specific domain or a general trait, as well as according to their psychometric evidence. In addition, different types of scales assessing domain-specific self-efficacy were also categorized. Although some trends could be identified from article titles and abstracts, the selected studies were reviewed in full following the final screening stage to ensure their proper description. The information was analyzed and summarized using Microsoft Excel (Version 16.0) and EndNote 21.

Results

The use of a machine learning-based article screening tool substantially reduced the manual screening process, enabling the efficient selection and exclusion of articles. Initially, 554 articles were identified across the five selected databases. The final selection was obtained according to the flowchart presented in Figure 1.

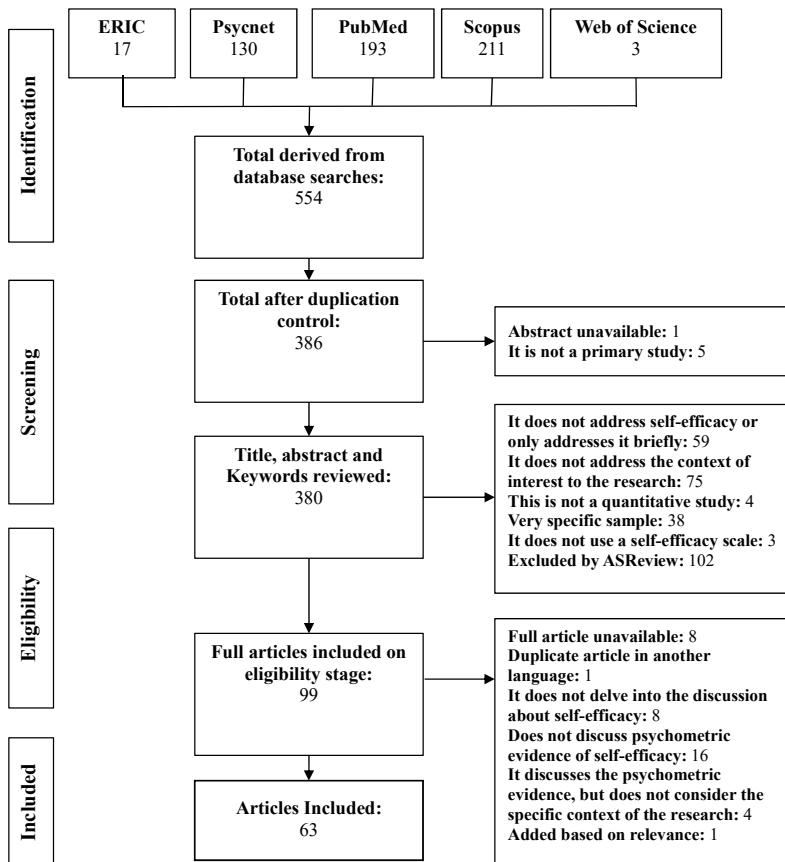


Figure 1. Data collection steps for literature review

Main Characteristics

Relevant publications reporting quantitative investigations that employed self-efficacy scales and were published between 2013 and 2023 were identified. Overall, the number of publications increased throughout this 10-year period. However, this increase was not stable, with peaks observed in 2020 and 2022, years in which more than 10 articles were published.

Regarding nationality, considering the nationality of the first author, most published articles originated from China (19.05%), followed by the United States (12.70%), Italy (11.11%), Turkey (6.35%), Spain (6.35%), and Brazil (6.35%). Other countries with lower publication frequencies included Sweden (3.17%), the United Kingdom (3.17%), Norway (3.17%), Poland (3.17%), Iran (3.17%), Australia (3.17%), Portugal (3.17%), Taiwan (3.17%), Indonesia (1.59%), Greece (1.59%), South Africa (1.59%), Japan (1.59%), India (1.59%), Germany (1.59%), the Netherlands (1.59%), and France (1.59%).

This systematic review sought to examine publications in organizational contexts across three fields: health, psychology, and education. When the proportion of publications across these fields was examined, no substantial imbalance was observed among them. Most articles focused on the health field (38.10%). Within this field, the samples investigated consisted of nurses, physicians, and caregivers. This was followed by studies in psychology (36.60%), which included research conducted from a Work and Organizational Psychology (WOP) perspective involving samples of employees working in public or private organizations, as well as clinical psychologists. Finally, studies in the field of education (25.30%) investigated samples of university students and teachers.

Self-Efficacy Scales

A total of 41 self-efficacy scales were identified, each designed to assess distinct dimensions of the construct. The most widely used scale among the publications included in the review corpus of the present study was the General Self-Efficacy Scale (GSES), originally developed by Jerusalem and Schwarzer (1981). Twenty publications (31.75%) were identified as having used some version of the GSES. Other scales intended to measure general self-efficacy included the Self-Efficacy Scale (Sherer et al., 1982), the General Self-Efficacy Scale developed by Yildirim and İlhan (2010), and the General Self-Efficacy Scale developed by Huang and Cheng (1996). Table 1 presents descriptive information on general self-efficacy scales identified in the international literature.

Table 1

Information on General Self-Efficacy Scales

Reference	Measure	No. of items	Dimensions
Jerusalem e Schwarzer (1981)	General Self-Efficacy Scale (GSES)	10	One-dimensional
Sherer et al. (1982)	Self-efficacy Scale (SES)	27	Three-dimensional
Yıldırım e İlhan (2010)	General Self-Efficacy Scale	23	Two-dimensional
Huang e Cheng (1996)	General Self-Efficacy Scale	17	One-dimensional
Yada et al. (2020)	Factors Related to Improved Self-Efficacy Scale	24	One-dimensional
Yada et al. (2020)	Factors Related to Decreased Self-Efficacy Scale	25	One-dimensional

Regarding domain-specific self-efficacy measures, the most frequently used instrument was the Occupational Self-Efficacy Scale - Short Form (4.84%). A smaller proportion of publications employed the Teachers' Sense of Efficacy Scale (3.23%), the Clinical Nurse Leader Self-Efficacy Scale (3.23%), Academic Self-Efficacy Scales (3.23%), and the Work Self-Efficacy Scale (3.23%). The remaining publications used distinct instruments designed to assess self-efficacy as a domain-specific construct. Table 2 presents descriptive information on domain-specific self-efficacy scales identified in the international literature.

Table 2

Information on Self-Efficacy Scales for Specific Domains

References	Instrument	No. of Items	Dimensions
Betz et al. (1996)	Career Decision Self-Efficacy Scale - Short Form	25	Five-dimensional
Wu (2017)	Media Multitasking Self-Efficacy Scale (MMSE)	5	One-dimensional
Kang et al. (2019)	Learning Self-Efficacy Scale for Clinical Skills	12	Three-dimensional

References	Instrument	No. of Items	Dimensions
Gori et al. (2022)	Therapist Self-Efficacy Scale	21	Six - dimensional
Tschannen-Moran et al. (2001)	Teachers' Sense of Efficacy Scale	24	Three-dimensional
Gözüm et al. (2023)	Teacher Self-Efficacy Scale in the Use of Information and Communication Technologies (ICT)	17	Three-dimensional
Brouwers & Tomic (2000, 2001)	Teacher Interpersonal Self-Efficacy Scale	24	Three-dimensional
Skaalvik & Skaalvik, (2007)	Norwegian Teacher Self-Efficacy Scale	24	Six-dimensional
Rigotti et al. (2008)	Occupational Self-Efficacy Scale - Short Form	6	One-dimensional
Schyns & von Collani (2002); Tani et al. (2009)	Occupational Self-Efficacy Scale	20	One-dimensional
Luna & Gondim (2022)	Occupational Self-Efficacy Scale for Work-Related Sickness	10	Three-dimensional
Loeb et al. (2016)	Occupational Social Self-Efficacy Scale	6	One-dimensional
Loeb et al. (2016)	Occupational Emotional Self-Efficacy Scale	8	Two-dimensional
Tschannen-Moran & Gareis (2004)	Principal Sense of Self-Efficacy Scale	18	Three-dimensional
Delgadillo et al. (2014)	Risk Assessment and Management Self-Efficacy Scale (RAMSES)	18	Three-dimensional
Kot et al. (2022)	Life Roles Self-Efficacy Scale (LRSES)	15	Five-dimensional
Ritter et al. (2022)	Caregiver Self-Efficacy Scale - Short Form	8	One-dimensional
Caruso et al. (2016)	Nursing Profession Self-Efficacy Scale	19	Two-dimensional
Gilmartin (2014)	Clinical Nurse Leader Self-Efficacy Scale	35	Nine-dimensional

References	Instrument	No. of Items	Dimensions
Carvalho et al. (2022)	Self-Efficacy Scale for Clinical Nurse Leaders	47	Seven-dimensional
Tucker et al. (2009)	Evidence-Based Nursing Practice Self-Efficacy Scale	17	One-dimensional
Watt et al. (2019)	Psychologists and Counselors Self-Efficacy Scale	31	Five-dimensional
Roczniowska et al. (2020)	Job Crafting Self-Efficacy Scale	9	Three-dimensional
Shea et al. (2012)	Reflective Supervision Self-Efficacy Scale for Supervisees	17	Four-dimensional
Rodrigues & Rebelo (2022)	Role Breadth Self-Efficacy Scale	5	One-dimensional
Zhou & Long (2011)	Creative Self-Efficacy Scale	4	One-dimensional
Phillips et al. (2011)	Perceived Palliative Care Questionnaire	12	Two-dimensional
Jawahar & Mohammed (2022)	Process Management Self-Efficacy Scale	9	One-dimensional
Greco et al. (2022)	Academic Self-Efficacy Scale	30	Seven-dimensional
Nielsen et al. (2018)	General Academic Self-Efficacy Scale	5	One-dimensional
Lagerveld et al. (2010)	Return-to-Work Self-Efficacy Questionnaire	11	One-dimensional
Cardoso & Baptista (2014)	Work Self-Efficacy Scale	23	Two-dimensional
Fan et al. (2013)	Work Social Self-Efficacy Scale	25	Four-dimensional
Chan et al. (2016)	Work-Life Regulation Self-Efficacy Scale	5	One-dimensional
Dybowski et al. (2016)	Physician Teaching Self-Efficacy Questionnaire (PTSQ)	16	Three-dimensional

Psychometric Analyses

The reviewed literature presented a broad range of psychometric analyses. The most frequently reported psychometric evidence consisted of reliability indices (100%), followed by confirmatory factor analyses (38%) and exploratory factor analyses (16%). Only 13% of the studies employed other analyses to provide psychometric information, including content validity testing, test–retest reliability analysis, principal component analysis, temporal stability testing, discriminant validity testing, convergent validity testing, and multigroup confirmatory analyses. However, each of these sources of evidence was reported considerably less frequently than the three previously mentioned. Additionally, 43% of the studies analyzed reported only Cronbach's alpha coefficients as psychometric evidence for the self-efficacy scales employed.

Psychometric Evidence for the General Self-efficacy

The literature included in the review corpus provides evidence regarding the reliability of the General Self-Efficacy Scale (GSES; Jerusalem & Schwarzer, 1981), as assessed through Cronbach's alpha coefficients among working populations in countries such as Italy ($\alpha = .90$, Gori et al., 2022; $\alpha = .87$, Sommaruga et al., 2017; $\alpha = .86$, Topino et al., 2022), Spain ($\alpha = .87$, Molero Jurado et al., 2018; $\alpha = .92$, Pérez-Fuentes et al., 2018; $\alpha = .82$, Van Hoy et al., 2022), India ($\alpha = .90$, Gandhi et al., 2021), Taiwan ($\alpha = .95$, Hu et al., 2018), Sweden ($\alpha = .87$, Skogevall et al., 2022), Norway ($\alpha = .93$, Van Hoy et al., 2022), the United Kingdom ($\alpha = .85$, Priesack & Alcock, 2015), and Japan ($\alpha = .88$, Yada et al., 2020).

There is a substantial use of the GSES in China, where multiple sources of psychometric evidence have been reported. These include $\alpha = .87$ among university students (Yu & Luo, 2018), $\alpha = .87$ and a test–retest reliability coefficient of .83 among medical personnel (Hu et al., 2020), $\alpha = .87$ among medical undergraduates (Yu et al., 2023), values ranging from $\alpha = .89$ to $\alpha = .93$ among caregivers (Jia et al.,

2021; Zhang & Sun, 2019), $\alpha = .90$ among nursing students (Cheng et al., 2019), $\alpha = .87$ among nurses (Cheng et al., 2020), $\alpha = .76$ among petroleum industry workers (Gu et al., 2020), and $\alpha = .81$ among teachers (Yu et al., 2015).

The General Self-Efficacy Scale developed by Huang and Cheng (1996) reported $\alpha = .91$ among nurses in Taiwan (Hsieh et al., 2019). The Self-Efficacy Scale (Sherer et al., 1982) reported $\alpha = .95$ among nurses in Iran (Eyni et al., 2023), and among workers in South Africa (Coetzee & Oosthuizen, 2013). The General Self-Efficacy Scale developed by Yildırım and İlhan (2010) reported $\alpha = .80$ among nursing students in Turkey (Karabacak et al., 2019). Finally, the Factors Related to Improved Self-Efficacy Scale (Yada et al., 2020) reported a Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy equal to .88, and Bartlett's Test of Sphericity also indicated satisfactory results for the sample of Japanese nurses. In contrast, the Factors Related to Decreased Self-Efficacy Scale (Yada et al., 2020) reported a KMO measure of sampling adequacy equal to .83 and Bartlett's Test of Sphericity equal to $\chi^2 (df) = 596.23 (66)$, $p < .001$ for the same sample of Japanese nurses.

Psychometric Evidence for the Specific Dimension

In the field of education, the Career Decision Self-Efficacy Scale - Short Form (Betz et al., 1996), the Teachers' Sense of Efficacy Scale (TschannenMoran et al., 2001), and the General Academic Self-Efficacy Scale (Nielsen et al., 2018) are the scales that present the most robust psychometric evidence. The Career Decision Self-Efficacy Scale - Short Form (Betz et al., 1996) reported, in a Turkish sample (Buyukgoze-Kavas, 2014), total reliability $\alpha = .88$, moderate-to-high correlations among factors, good model fit indices ($\chi^2 = 338.48$; $df = 129$; $p < .01$; $CFI = .94$; $GFI = .95$; $RMSEA = .048$), and all estimated model parameters were statistically significant and ranged from .34 to .75. For teachers, the Teachers' Sense of Efficacy Scale (TschannenMoran et al., 2001) reported, in the Spanish context (Moyano et al.,

2023), satisfactory CFA indices ($\chi^2 = 503.81$; $df = 241$; $CFI = .93$; $TLI = .92$; $RMSEA = .05$; $SRMR = .05$) and reliability coefficient $\omega = .89$. The scale was also applied to teachers from a primary school in the United States (Pressley & Rangel, 2023) and reported reliability $\alpha = .96$. Regarding the General Academic Self-Efficacy Scale (Nielsen et al., 2018), this instrument was administered to university students in the United States, Belgium, and the Netherlands (van Zyl et al., 2022). Across all groups, the scale reported good model fit indices ($\chi^2 = 45.60$; $df = 29$; $p > .001$; $CFI = .99$; $TLI = .99$; $RMSEA = .002$; $SRMR = .002$), good temporal stability, and reliability coefficients $\alpha = .74$ and $\omega = .78$.

Within the same field, studies reporting both confirmatory factor analyses and reliability tests as their primary sources of psychometric evidence were also identified. The Media Multitasking Self-Efficacy Scale (Wu, 2017) reported, in an Indonesian sample, a McDonald's omega coefficient of $\omega = .792$, and confirmatory factor analysis also indicated satisfactory fit indices ($CFI = .99$; $NNFI = .97$; $NFI = .99$; $GFI = .99$; $AGFI = .97$; $RMSEA = .071$; $SRMR = .023$) (Simanjuntak et al., 2022). The Learning Self-Efficacy Scale for Clinical Skills (Kang et al., 2019) reported satisfactory fit indices in confirmatory factor analysis ($\chi^2 = 163.75$; $df = 74$; $p < .01$; $RMSEA = .06$; $GFI = .98$; $AGFI = .98$; $IFI = .98$; $CFI = .98$; $NFI = .97$) and an overall reliability coefficient of $\alpha = .91$ (Bayazit et al., 2022).

Teacher Self-Efficacy Scale in the Use of ICT (Gözüm et al., 2023) was developed for use with teachers in Turkey and reported good fit indices according to the CFA results ($\chi^2 = 249.527$; $df = 116$; $p < .001$; $AGFI = .92$; $CFI = .94$; $GFI = .95$; $IFI = .95$; $NFI = .90$; $RMSEA = .04$), as well as reliability coefficients above $\alpha = .84$ for all dimensions. Likewise, the Teacher Interpersonal Self-Efficacy Scale (Brouwers & Tomic, 2000; Brouwers & Tomic, 2001) reported reliability coefficients above $\alpha = .92$, and the CFA supported a three-factor model with adequate fit ($\chi^2 = 434.61$; $df = 249$; $AGFI = .92$; $CFI = .83$; $RMSEA = .08$) in a Spanish sample (Garcia Ros et al., 2015).

The Creative Self-Efficacy Scale (Zhou & Long, 2011) reported good fit indices in a sample of teachers working in primary and secondary schools in China ($\chi^2 = 171.93$; $\chi^2/df = 2.73$; $CFI = .95$; $TLI = .92$; $RMSEA = .07$; $SRMR = .05$), as well as a reliability coefficient of $\alpha = .77$ (Li et al., 2017). The Academic Self-Efficacy Scale (Greco et al., 2022) reported good fit indices in a sample of Italian university students ($\chi^2 = 30.137$; $df = 14$; $p < .01$; $CFI = .96$; $TLI = .95$; $RMSEA = .078$; $SRMR = .038$), as well as coefficients above $\alpha = .65$ and $\omega = .65$ for all dimensions, and evidence of measurement invariance.

Both the Norwegian Teacher Self-Efficacy Scale (Skaalvik & Skaalvik, 2007) and the Principal Sense of Efficacy Scale (Tschannen-Moran & Gareis, 2004) did not conduct confirmatory factor analyses to investigate the psychometric properties of the self-efficacy scales employed. However, both studies performed other analyses in conjunction with reliability testing. The Norwegian Teacher Self-Efficacy Scale (Skaalvik & Skaalvik, 2007) was administered to a Norwegian sample (Skaalvik & Skaalvik, 2014) and reported a reliability coefficient of $\alpha = .93$, while the test-retest reliability coefficient was .65 over a six-month interval. The Principal Sense of Efficacy Scale (Tschannen-Moran & Gareis, 2004) was adapted for use in the Macedonian context (Papaioannou et al., 2022) and reported a total explained variance of 60.16%, factor loadings exceeding 50%, and a reliability coefficient of $\alpha = .913$.

For investigations in the field of psychology, the studies analyzed generally reported more robust psychometric evidence for the scales employed in comparison with studies from other fields. In particular, the Occupational Self-Efficacy Scale - Short Form (Rigotti et al., 2008), the Psychologists and Counsellors Self-Efficacy Scale (Watt et al., 2019), and the Work Social Self-Efficacy Scale (Fan et al., 2013) demonstrated particularly robust psychometric evidence across the studies included in the review corpus of this systematic review.

The Occupational Self-Efficacy Scale - Short Form (Rigotti et al., 2008) was administered to samples from Brazil, Germany, Sweden, and China. For the Brazilian sample, the scale reported satisfactory reliability coefficients ranging from $\alpha = .78$ (Damásio et al., 2014) to

$\alpha = .83$ (Salvador & Ambiel, 2019), as well as satisfactory fit indices based on CFA results ($\chi^2/df = 1.64$; $CFI = .98$; $TLI = .96$; $RMSEA = .05$; $SRMR = .07$) (Damásio et al., 2014). The scale also reported satisfactory reliability coefficients for the German and Swedish samples, with $\alpha = .79$ (Loeb, 2016). For the Chinese sample, high correlations between individual items and the total scale score were identified, as well as high item discrimination, fit indices consistent with the previous literature ($\chi^2/df = 4.53$; $GFI = .95$; $CFI = .95$; $AGFI = .88$; $RMSEA = .09$ to $.17$), a reliability coefficient of $\alpha = .85$, and a test–retest reliability coefficient of $.85$ after four weeks (Peng et al., 2021).

The Psychologists and Counsellors Self-Efficacy Scale (Watt et al., 2019) was administered to psychology and counselling students at Australian universities. CFA demonstrated adequate fit indices for both the initial sample ($\chi^2 = 753.45$; $df = 423$; $CFI = .909$; $NNFI/TLI = .900$; $RMSEA = .063$; $SRMR = .054$) and the cross-validation sample ($\chi^2 = 864.95$; $df = 423$; $CFI = .905$; $NNFI/TLI = .896$; $RMSEA = .070$; $SRMR = .053$). Reliability indices also indicated satisfactory results, with coefficients above $\alpha = .80$ for all dimensions. In turn, the Work Social Self-Efficacy Scale (Fan et al., 2013) was administered to American university students. CFA results indicated satisfactory model fit ($\chi^2 = 778.02$; $df = 203$; $p < .01$; $CFI = .96$; $NNFI = .95$; $SRMR = .07$). All items demonstrated significant factor loadings, with a mean factor loading of $.79$, and the reliability coefficient was satisfactory ($\alpha = .93$). In addition, the Work Social Self-Efficacy Scale demonstrated strong correlations with general social self-efficacy ($r = .67$, $p < .01$), political skill ($r = .55$, $p < .01$), organization-based self-esteem ($r = .53$, $p < .01$), and a weaker correlation with confidence in the use of technological skills ($r = .22$, $p < .01$).

The Therapist Self-Efficacy Scale (Gori et al., 2022) also demonstrated robust psychometric evidence. The scale was developed and administered in Italy and reported good fit indices according to CFA results ($CFI = .956$; $NNFI = .949$; $RMSEA = .075$; $SRMR = .029$), reliability coefficients of $\alpha = .93$ and $\omega = .94$, and item-total correlations ranging from $.653$ to $.867$. The Life Roles Self-Efficacy Scale (Kot

et al., 2022) was developed and administered to a sample of university students in Poland. The scale demonstrated satisfactory internal consistency, with coefficients above $\alpha = .83$. In addition, CFA indicated satisfactory model fit ($\chi^2 = 217.57$; $p < .001$; $\chi^2/df = 2.72$; $CFI = .96$; $GFI = .95$; $TLC = .94$; $RMSEA = .06$; $SRMR = .04$), factor loadings were acceptable and ranged from .72 to .89, and test–retest analyses demonstrated measurement reliability over a two-week period. The Role Breadth Self-Efficacy Scale (Rodrigues & Rebelo, 2022) was administered to a sample of Portuguese workers. The analyses indicated satisfactory reliability ($\alpha = .86$), and CFA demonstrated that the proposed model showed good fit ($\chi^2 = 115.05$; $df = 76$; $p = .003$; $CFI = .965$; $TLI = .958$; $RMSEA = .059$; $SRMR = .048$), with all items presenting appropriate and statistically significant factor loadings on their respective factors.

The Job Crafting Self-Efficacy Scale (Roczniewska et al., 2020) was administered to samples of Polish and American workers. The study indicated that the scale demonstrated satisfactory fit indices for the shortened multidimensional version comprising nine items ($\chi^2/df = 2.63$; $CFI = .94$; $TLI = .91$; $RMSEA = .061$). Reliability coefficients for all dimensions ranged from $\alpha = .62$ to $\alpha = .83$. In addition, test–retest reliability analyses revealed similarly high correlations between the results obtained in data collection waves 1 and 2 across all factors. The Process Management Self-Efficacy Scale (Jawahar & Mohammed, 2022) was developed and validated using a sample of American managers. CFA indicated that the one-factor model demonstrated adequate fit ($\chi^2 = 51.34$; $df = 27$; $p < .001$; $CFI = .94$; $RFI = .93$; $RMSEA = .06$; $SRMR = .05$), and all items exhibited statistically significant factor loadings. Reliability indices were also satisfactory, with values exceeding $\alpha = .91$.

The Work Self-Efficacy Scale (Cardoso & Baptista, 2014) was administered to Brazilian participants and, based on CFA results, demonstrated factor loadings above .40 for all dimensions and satisfactory fit indices ($\chi^2/df = 2.30$; $CFI = .92$; $TLI = .92$; $RMSEA = .08$). Reliability, calculated using Orion's precision index, exceeded .95 for all dimensions

(Cardoso & Baptista, 2018). The Work-Life Regulation Self-Efficacy Scale (Chan et al., 2016) was developed and administered to samples of university students as well as public- and private-sector workers in Australia. CFA demonstrated adequate fit indices for university students ($\chi^2 = 9.52$; $df = 3$; $p = .02$; $CFI = .99$; $TLI = 1.0$; $GFI = .99$; $RMSEA = .06$; $SRMR = .01$), public-sector workers ($\chi^2 = 4.67$; $df = 3$; $p = .01$; $CFI = 1.0$; $TLI = 1.0$; $GFI = .99$; $RMSEA = .05$; $SRMR = .01$) and private-sector workers ($\chi^2 = 5.73$; $df = 3$; $p = .013$; $CFI = 1.0$; $TLI = .99$; $GFI = .99$; $RMSEA = .06$; $SRMR = .01$). Reliability coefficients were $\alpha = .95$, $\alpha = .96$, and $\alpha = .94$ for each sample, respectively.

The Social Occupational Self-Efficacy Scale (Loeb et al., 2016) and the Emotional Occupational Self-Efficacy Scale (Loeb et al., 2016) were administered to German and Swedish participants. Both scales demonstrated positive correlations with the Occupational Self-Efficacy Scale - Short Form (Rigotti et al., 2008), as well as composite reliability coefficients above .70, indicating adequate reliability across all factors. The scales also demonstrated acceptable fit indices in both Germany and Sweden ($\chi^2 = 897.7$; $df = 146$; $CFI = .902$; $RMSEA = .079$). Luna and Gondim (2022) adapted and administered the Occupational Self-Efficacy Scale for Work-Related Sickness to a sample of industrial workers who had not taken leave from work. EFA confirmed a three-factor structure accounting for 58.6% of the total variance, consisting of task completion, affective management, and social support at work. Bartlett's Test of Sphericity was significant ($p < .01$). CFA indicated satisfactory fit indices for the three-factor model ($\chi^2 = 75.241$; $df = 41$; $CFI = .992$; $TLI = .989$; $RMSEA = .06$). Cronbach's alpha coefficients for the three factors were $\alpha = .87$, $\alpha = .87$, and $\alpha = .77$, indicating adequate reliability.

The Return-to-Work Self-Efficacy Questionnaire (Lagerveld et al., 2010) was validated in a sample of workers in Norway (Gjengedal et al., 2021). EFA identified a solution that explained 54.43% of the variance, factor loadings for all items ranged from .52 to .88, and the reliability coefficient was $\alpha = .91$. The Risk Assessment and Management Self-Efficacy Scale (Delgadillo et al., 2014) also demonstrated satisfactory results based on EFA, with all items presenting factor

loadings above .40 and a reliability coefficient of $\alpha = .96$ when administered to a sample of volunteers providing mental health services in the United Kingdom. For the studies analyzed, both scales reported only EFA results and reliability indices.

Among the psychology-focused investigations included in this review, the Reflective Supervision Self-Efficacy Scale for Supervisees (Shea et al., 2012) and the Occupational Self-Efficacy Scale (Schyns & von Collani, 2002; Tani et al., 2009) were the instruments that presented the least robust report for psychometric evidence. The Reflective Supervision Self-Efficacy Scale for Supervisees (Shea et al., 2012) was administered to therapists in Michigan (Shea et al., 2020) and to early intervention professionals from two cities in the southern United States (Frosch et al., 2018). Factor loadings for the items comprising the scale exceeded .40, and each subscale also demonstrated reliability coefficients above $\alpha = .75$ for the Michigan therapist sample. The scale reported an overall Cronbach's alpha coefficient of $\alpha = .91$ for the sample from the two cities in the southern United States. The Occupational Self-Efficacy Scale (Schyns & von Collani, 2002; Tani et al., 2009) was administered to an Italian sample and reported a reliability coefficient of $\alpha = .90$ (Guarnaccia et al., 2018).

For studies in the health field, the instruments that demonstrated the most robust psychometric evidence were the Medical Teaching Self-Efficacy Questionnaire (Dybowski et al., 2016) and the Nursing Profession Self-Efficacy Scale (Caruso et al., 2016). The Medical Teaching Self-Efficacy Questionnaire (Dybowski et al., 2016) was developed and administered to a German sample. The instrument demonstrated a reliability coefficient of $\alpha = .90$, adequate fit indices according to CFA results ($CFI = .948$; $TLI = .939$; $RMSEA = .055$; $SRMR = .048$), and all items exhibited factor loadings above .40. Its short version demonstrated a reliability coefficient of $\alpha = .82$. CFA indicated adequate fit indices ($CFI = 1.000$; $TLI = 1.007$; $RMSEA = .000$; $SRMR = .014$), and all items exhibited factor loadings above .40. Both versions demonstrated a high intercorrelation ($r = .946$), and their mean scores were nearly identical.

The Nursing Profession Self-Efficacy Scale (Caruso et al., 2016) was administered in Italian hospitals. CFA evidence indicated adequate model fit for the sample ($\chi^2 = 183.47$; $df = 92$; $CFI = .90$; $NNFI = .86$; $RMSEA = .059$; $WRMR = 1.00$). Factor loadings exceeded .44 and explained 49.3% of the total variance. Regarding reliability, the scale demonstrated $\alpha = .83$. The same scale was also administered to another sample of Italian nurses (Dellafiore et al., 2022), reporting a reliability coefficient of $\alpha = .83$. The Self-Efficacy Scale for Clinical Nurse Leaders was adapted for the Portuguese context (Carvalho et al., 2022), reporting a reliability coefficient of $\alpha = .96$. CFA indicated good model fit ($CFI = .899$; $GFI = .800$; $RMSEA = .055$), and all items demonstrated factor loadings above .40. The Caregiver Self-Efficacy Scale - Short Form (Ritter et al., 2022), which was developed and administered in the United States, demonstrated internal consistency coefficients ranging from $\alpha = .88$ to $\alpha = .89$, item-scale correlations ranging from .44 to .78, and a test-retest reliability coefficient of $r = .75$ after two weeks. The Perceived Palliative Care Questionnaire (Phillips et al., 2011) was adapted for a sample of Iranian nurses (Dehghani et al., 2020) and demonstrated an average content validity index of 1 and an overall reliability coefficient of $\alpha = .704$.

Finally, the Evidence-Based Nursing Practice Self-Efficacy Scale (Tucker et al., 2009) and the Clinical Nurse Leader Self-Efficacy Scale (Gilmartin, 2014) demonstrated weaker psychometric evidence reporting among the studies analyzed. The Evidence-Based Nursing Practice Self-Efficacy Scale (Tucker et al., 2009) was adapted and administered to a sample of nurses in the United States (Boswell et al., 2020), reporting reliability coefficients ranging from $\alpha = .95$ to $\alpha = .97$. In turn, the Clinical Nurse Leader Self-Efficacy Scale (Gilmartin, 2014) was administered to an American sample and reported reliability coefficients ranging from $\alpha = .83$ to $\alpha = .98$. In most cases, studies conducted in the health field reported psychometric evidence for the scales employed with less rigor and detail and more frequently utilized general self-efficacy scales rather than domain-specific self-efficacy measures.

Discussion

Since its definition by Bandura (1977), self-efficacy has become an important topic of investigation in psychology and several other fields of knowledge. As a broad and complex construct, the literature on self-efficacy includes studies that examine it both as a general dimension for understanding its effects and as a domain-specific construct. The present systematic literature review aimed to identify which scales and what types of psychometric evidence are available regarding the measurement of self-efficacy in organizational and work contexts. To achieve this objective, two specific objectives were formulated to guide the analysis of the literature included in the present study: (1) to identify which general and domain-specific self-efficacy scales are used in organizational and work contexts, and (2) to identify the psychometric evidence available for these scales.

Regarding the first objective, the present review identified 63 publications that met the established inclusion criteria and 41 different self-efficacy scales used to investigate the construct. The analysis of the literature revealed that a substantial proportion of publications used the General Self-Efficacy Scale (GSES) developed by Jerusalem and Schwarzer (1981). This finding indicates that, although many scholars understand self-efficacy as a construct that is more appropriately examined at the domain-specific level (Newman et al., 2019), consistent with Bandura's (1997) conceptualization of the construct, the GSES (Jerusalem & Schwarzer, 1981) remains the most frequently used instrument for investigating self-efficacy. According to Bandura (2012), individuals differ in their efficacy across distinct domains of functioning. Therefore, self-efficacy cannot be considered a decontextualized disposition that can be adequately assessed through a broad and comprehensive test. Consequently, the development and validation of self-efficacy scales require attention to specific domains of functioning rather than to a general domain (Bandura, 1997).

A review of the literature reveals numerous studies indicating that general self-efficacy is capable of predicting important behav-

iors and outcomes (Gori et al., 2022; Hsieh et al., 2019; Yu & Luo, 2018). Schwarzer and Jerusalem (1995) proposed the General Self-Efficacy Scale to investigate the belief that individuals can succeed in new or difficult tasks across a wide range of content domains. This perspective assumes that, when individuals experience accomplishments across multiple situations or tasks, they may develop a generalized perception of their own capabilities and knowledge (Hanss & Bohm, 2010).

However, it is important to emphasize that, according to Bandura's theory, measures of general self-efficacy violate the fundamental premise of the multidimensionality of self-efficacy beliefs (Bandura, 1997). Ideally, a self-efficacy measure should correspond, in its level of specificity, to the performance criterion of interest. That is, if the criterion is grounded on performance in teaching a class to higher education students, then the self-efficacy measure should represent the individual's beliefs regarding their performance in that specific task. Conversely, if the criterion is grounded on overall performance in carrying out tasks within the work environment, the self-efficacy measure should be somewhat broader in scope. In light of this, the importance of using domain-specific instruments to strengthen the quality of evidence derived from research and interventions should be emphasized.

Although a generic scale that can be used across multiple contexts may be convenient for research purposes, the use of general self-efficacy measures is not recommended, as they are less precise than domain-specific measures (Bandura, 1997; Locke & Latham, 1990). Different self-efficacy measures used to assess the same domain may yield different results (Liu et al., 2020). Therefore, it is recommended that researchers employ instruments that are theoretically aligned with the domain under investigation to ensure measurement quality.

To address the second specific objective, the present study also identified the psychometric evidence reported in the literature for both general and domain-specific self-efficacy scales. The psychometric information identified included reliability analyses, exploratory factor analyses, confirmatory factor analyses, test-retest reliability analyses,

convergent validity tests, discriminant validity tests, and correlation analyses. The psychometric evidence most frequently reported in the literature consisted primarily of reliability indices, followed by exploratory factor analyses and confirmatory factor analyses.

According to the literature analyzed, the GSES presented psychometric evidence across the widest variety of contexts among general-domain measures. Psychometric evidence was identified predominantly for applications involving health professionals. The different contexts in which the scale was applied within the health field included Spain (Pérez-Fuentes et al., 2018), China (Cheng et al., 2020; Gu et al., 2020; Hu et al., 2020; Jia et al., 2021; Zhang & Sun, 2019), India (Gandhi et al., 2021), Italy (Sommaruga et al., 2017), Taiwan (Hu et al., 2018), Sweden (Skogevall et al., 2022), and the United Kingdom (Priesack & Alcock, 2015). Evidence for other general-domain scales was also identified, although less frequently (Coetzee & Oosthuizen, 2013; Eyni et al., 2023; Hsieh et al., 2019; Karabacak et al., 2019; Yada et al., 2020).

Among studies focusing on domain-specific self-efficacy, the scales most frequently investigated occupational self-efficacy, teacher self-efficacy, and nurses' self-efficacy. For occupational self-efficacy, psychometric evidence was identified for workers in Brazil (Damásio et al., 2014; Salvador & Ambiel, 2019), Germany and Sweden (Loeb, 2016), Italy (Guarnaccia et al., 2018), and China (Peng et al., 2021). Teacher self-efficacy measures demonstrated psychometric evidence in samples of teachers from Spain (Brouwers & Tomic, 2000; Brouwers & Tomic, 2001; Skaalvik & Skaalvik, 2014) and Turkey (Gözüm et al., 2023). Finally, psychometric evidence was identified for scales focusing on nurses' self-efficacy in Italy (Caruso et al., 2016; Dellafiore et al., 2022), the United States (Boswell et al., 2020; Gilmartin, 2014), and Portugal (Carvalho et al., 2022).

However, despite the breadth of psychometric evidence identified by this literature review, it is important to note that a substantial proportion of the publications reported only reliability indices (e.g., Cronbach's alpha) as psychometric evidence. All studies analyzed

included evidence regarding reliability indices; however, 43% of the studies reported these indices as the sole source of psychometric evidence for the scales employed. These findings should be interpreted with caution, as Cronbach's alpha may be insufficient for assessing an instrument's reliability, given its stringent assumptions, which are often violated in practice (McNeish, 2018). In light of this, despite the large volume of publications employing self-efficacy scales in organizational and work contexts within the health and education fields, this review identified that studies using more robust psychometric validation methodologies are concentrated predominantly within the field of psychology.

Conclusions

The present systematic review was able to compile and synthesize a body of evidence regarding self-efficacy scales and their psychometric properties. A total of 63 articles employing either general-domain or domain-specific self-efficacy scales were analyzed. At the time this systematic review was conducted, the authors were unable to identify similar publications aimed at investigating self-efficacy scales and their psychometric evidence at an international level. Therefore, the findings of the present study contribute by providing a resource to support future research and interventions focused on career and work-related issues through the use of self-efficacy scales, with particular attention to the psychometric evidence available for these instruments. This review also offers a methodological contribution by employing ASReview to support the screening process, streamlining study selection through its machine learning system and allowing the authors to avoid manually reviewing approximately 25% of the publications initially identified.

Despite achieving its proposed objectives, this study also presents some limitations. First, the review focused on publications from the fields of health, psychology, and education, while excluding studies involving more specific populations, such as individuals with

disabilities, chronic illnesses, or psychopathological conditions. Consequently, future studies are encouraged to address the gaps identified in the present review. Future research on self-efficacy is also encouraged to investigate the psychometric properties of scales using additional sources of evidence beyond Cronbach's alpha, as reliance on this index alone may be insufficient for adequately evaluating instrument quality and may consequently introduce methodological limitations into research and interventions related to career and work. In addition, the need to employ domain-specific self-efficacy scales is reiterated, with items that adequately reflect the scope of the phenomenon under investigation. Doing so helps safeguard the quality of measurement and the interpretation of findings.

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