Evidence-Based Social Sciences and Practices: A Scoping Review

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ABSTRACT

Introduction: The evidence-based medicine (EBM) was introduced in the 1990s, paving the way for the new approaches to science methodology and research evidence that changed medicine-related practices. Following the EBM, social sciences ranging from education to public governance and policymaking entered a new stage of knowledge production and dissemination. Each evidence-based social science field produces its own evidence and evidence synthesis laying the foundation for efficient social practices. Pilot searches failed to bring complex and complete evidence-based methodology for social sciences.

Purpose: This scoping review aims to identify the scope of the evidence-based social sciences and practices as an emerging field.

Method: The review adhered to the PRISMA extension for scoping reviews, and the PPC framework. The eligibility criteria include problem (population), concept, context, language, time period, types of sources, geographical location, databases, areas of research. The searches to identify relevant publications entail searches in the Scopus database. The studies were identified and selected by screening titles, abstracts and full texts, totalling 35 documents.

Results: The results cover search and selection outcomes; a bibliometric analysis, the breakdown of the publications among the four thematic clusters; the findings relating to evidence-based medicine and practice methodology applicable to social sciences; the analysis of the research area of evidence-based social sciences and practices; the social science practices by sectors. Much of the EBM methodology was directly borrowed by social sciences. Though, the major controversy was found in the hierarchy and levels of evidence as social sciences are subject to human choices. Randomized controlled trials and systematic reviews were analysed in the context of social sciences. The most elaborated and fast developing evidence-based areas in social sciences contained evidence-based education and evidence-based policymaking, with systems of governmental agencies and institutions introducing these evidence-based practices.

Conclusion. The review attained the objective and gave answers to the research questions. Only few studies were published to comprehensively address the emerging field of evidence-based social sciences and practices. Fragmentated sub-fields are covered unevenly, with many mythological divergences and disputed issues, including the quality of evidence, their weight and hierarchy, types of research.

KEYWORDS

evidence-based social sciences, evidence-based practice, hierarchy of evidence, systematic review, evidence-based policymaking, evidence-based education, research synthesis, knowledge production

INTRODUCTION

The early 1990s brought scientific medicine into existence which was later embodied into the concept of evidence-based medicine (EBM) (Wyer & Silva, 2009). The new concept was attributed to "an increasing awareness of the weaknesses of standard clinical practices" (Sur & Dahm, 2011) that implied a decreasing quality of healthcare and lowering credibility of medicine as a research field. Evidence-based medicine provides for explanations of the quality

of evidence, levels of evidence, bias, and the credibility of experts' opinion (Wyer & Silva, 2011).

Efforts have been made to enhance the credibility of research evidence across various disciplines and sectors (Gleeson et al., 2023), ranging from better knowledge production and dissemination to systems of practical appliances of research evidence (Boaz & Nutley, 2019). An interest taken by the academe in evidence-based methodology was prompted by a general replication crisis resulting in plummeting credibility to theories and science at large (Brown et al., 2014). Failures to replicate research are rooted in poor quality and deficiencies in methodology; dubious evidence, mainly based on experts' opinion; academic misconduct, including falsification and fabrication of data; defective reporting of research results due to poor academic literacy; inadequate peer review and overlooked or missed biases in research results (Brown et al., 2014; Rouphael, 2022).

Evidence-based medicine has been developing since the 1990s to offer a new methodology and approach to evidence transferred and incorporated in other sciences (Schwarz & Tilling, 2023; Reiss, 2016; Weber et al., 2024; Mahmoudi et al., 2024; Klose, 2024). The first publications on specific issues of evidence-based social sciences and practices first appeared on the turn of the century (Ackers, 2000; Humphries, 2003).

The spread of evidence-based practices beyond medicine and healthcare began with the emergence of governmental agencies in the US, the UK, Australia, Sweden and other sparse countries in the 1990s and early 2000s where evidence-based methodology was incorporated in the processes of working out new social and economic policies (Ackers, 2000). The policy objectives were to increase efficacy and efficiency of political efforts, to support public management with the best practices proved by research evidence. But evidence-based practices are not ubiquitous (Boaz & Nutley, 2019). Quite a few countries (mainly Anglophone) and not many sectors (policymaking, management, education and a few more) stick to the evidence-based methodology (Klose, 2024).

Practices and hierarchy of evidence across disciplines and sectors are subject to great variance. All sectors and disciplines seem to be studied individually (Harris & Williams, 2019; den Heyer, 2022; Schwarz & Tilling, 2023). The pilot searches of the Scopus database, Semantic scholar, and Research Gate have found neither reviews of evidence-based sciences, nor research on the evidence-based methodology in social sciences across disciplines. So far there are no umbrella textbooks or monographs covering evidence-based social sciences. Even the term "evidence-based social sciences" has been used in few publications only occasionally (Zarghi & Khorasani, 2018).

Social sciences essentially borrow evidence-based methodology from evidence-based medicine with elaborating those components that could fail to fit in social science research. Evidence itself is construed in ways different from medicine as some studies show (Knezevic et al., 2024; Shan & Williamson, 2021). Thus, there is no comprehensive reinvention of evidence-based methodology in social sciences. Probably, it explains why instead evidence-based social sciences researchers more often study evidence-based practices as sets of methods and approaches applied within a field or sector.

This review aims to synthesize research on evidence-based social sciences and practices to identify the scope and cohesion of the emerging field. To attain the review objective, we are to answer the following research questions:

(1) What is the impact of EBM studies on research on evidence-based social sciences and practices?

(2) What is the scope of research field of evidence-based social sciences and practices?

(3) What are the key features specific of individual evidence-based social science practices by sectors?

METHOD

Protocol

Commencing the present scoping review, we meticulously developed a research protocol. The authors hereby certify that this review report constitutes a faithful, precise, and transparent depiction of the review conducted; no deviations from the protocol were registered; all significant issues were reported comprehensively; and any departures from the original study design have been duly elucidated. This scoping review adhered to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) extension for Scoping Reviews (Tricco et al., 2018) and the framework proposed by Arksey and O'Malley (2005).

Search Eligibility Criteria

The population/problem, concept, and context (PCC) framework was applied to establish an effective search strategy (Table 1), with a rationale for each criterion.

Search Strategies

This review systematically interrogated the Scopus database to identify relevant publications. The search was conducted using a combination of the keywords "evidence-based" AND "social sciences" on May 10, 2024.

The search in the refence lists was applied to the publications selected from the Scopus database after screening of

Table 1
Eligibility criteria

Criterion	Inclusion	Exclusion	Rationale
Population/Problem	N/A	N/A	As the review focuses essentially on the concept of evidence-based social sciences and practices. Neither population, nor problem is applicable
Concept	Evidence-based social sciences and practices	Other concepts	The aim of the review is to identify the scope and recent trends of evidence-based social sciences
Context	Social sciences and practices, notions of evidence-based medicine as applicable to social sciences	Other disciplines	Focus of the review is on evidence-based sciences and practices
Language	English	Other languages	The language choice is identified by its status as a lingua franca of international science
Time period	2000-till now	Before 2000	The pilot searches proved that the earliest documents appeared on the turn of the century
Types of sources	Full texts of articles, reviews, editorials, books, book chapters and other types of publications	Unavailable sources, unavaiable full texts	This review aims to get a comprehensive understanding of the field
Geographical location	Any location	None	Getting international perspective
Database	Scopus	Other than Scopus	The Scopus database was selected as one of the biggest of high-quality publications on social sciences
Areas of Research	Social Sciences	Other Research Areas	As the review focuses on social sciences, other fiends were not included. As the field "Medicine" offers documents on social practices marked also as "Social Sciences", they were essentially eliminated from the review as non-applicable, though a few were retrieved as they were of general nature applicable to the methodology of evidence-based social sciences

the titles, abstracts and full texts. The full-text publications eligible for the review were identified after screening.

Study Selection

Two reviewers identified studies applying the eligibility (inclusion and exclusion) criteria. After filtering the documents in the Scopus database (period; language; subject area), the reviewers individually screened the titles and abstracts of the identified documents. Both authors marked all publications with their decision "to include" or "to exclude". Then the individual decisions were discussed in case of disagreement. A consensus was reached on each disputable document regarding the eligibility criteria.

The authors searched for the full texts of the previously selected publications. The full texts were found either via open access or at request applied to the publications' authors through the Research Gate. Each of the full-text papers was thoroughly read and analysed by each reviewer to identify their relevance to the review.

The relevant publications found in the reference list of the selected studies were included subject to full text.

Data Extraction

Whist pilot-searching for the relevant publications, the authors individually singled out thematic clusters that potentially described the field of evidence-based social sciences and practices, then iteratively compared the clusters and identified them by mutual agreement (Table 2).

Based on the research questions and the hypothetical thematic clusters, the reviewers tailored a table for the data extraction that included two categories titled "evidence-based social sciences" and "evidence-based practices".

We conducted a preliminary test of this form using a subset of ten relevant studies to ensure accuracy. When the form had been approved, each author entered the raw data from all articles into the table. Then the data were compared. If different, they were eliminated or kept by mutual consent.

Data Analysis and Synthesis

We categorized the raw data essential for this review as "evidence-based social sciences" and "evidence-based prac-

Table 2

Thematic Clusters of the Review (Authors' Hypothesis)

	Thematic cluster	Shortened title
1	evidence-based social sciences	EBSS
2	evidence-based practices (across sectors and disciplines)	EBP
3	hierarchy of evidence	evidence
4	knowledge production	knowledge production

tices", compiling lists of potential features and elements. These categories included the following:

(1) Evidence-based social sciences: data relating to methodology of evidence-based social sciences, including the specific methods applied across various disciplines; evidence-based medicine postulates applicable to social sciences; hierarchy of evidence; knowledge synthesis and production;

(2) Evidence-based practices: data on the evidence-based production and synthesis of knowledge applied in social practices, in policymaking and other social sectors.

RESULTS

Search and Selection Results

A total of 565 records were initially found in the Scopus database. After applied filters (period; language; subject area) the total decreased to 166 studies that were eligible for title and abstract screening. After title and abstract screening, 88 articles were deemed irrelevant and excluded. Then 17 articles without full texts were excluded. After full articles screened, 26 articles were included in the final analysis. A thorough search in the reference lists of the 26 retrieved studies brought another 9 full-text papers. The PRISMA flow-chart (Figure 1) depicts the identification and screening procedure.

A Bibliometric Analysis

The ultimate 35 documents retrieved for the review is unevenly distributed from 2007 to 2024, with a high of 9 this year (incomplete data). The documents for 2009, 2011, and 2015 are not available (Figure 2). Five journals published two articles each, including *BMC Medical Education, Journal of Clinical Epidemiology, Journal of Development Effectiveness, Research on Social Work Practice*, and *Social Science and Medicine*. The other 25 journals brought out one publication each. Nine out of the 30 journals belong to medicine-related fields.

The most prolific authors include Hamel, C. (2 publications); Moher, D. (2 publications); Shea, B.J. (2 publications); Tugwell, P. (2 publications); and White, H. (2 publications). The

other 92 researchers authored one publication each. The average number of authors per publication is 2.77.

The geographic breakdown of the publications (see Fig.3) entails the USA with nine publications; Australia (4 documents); the UK (4 publications); Belgium (3 documents); India (3 articles). Another six countries accounted for two publications each (Canada, China, Denmark, Netherlands, Spain, and Sweden). The other seven countries had one documents each.

According to the inclusion criteria, the documents under review included all types of publications. The review contains 26 articles (74.3 per cent), 5 reviews (14.3 per cent), 3 notes (8.6 per cent), and 1 editorial (2.9 per cent). All documents were in the Social Sciences domain. But as many of them entered more than one subject area, 8 documents also belonged to Arts & Humanities, 8 documents to Medicine, 6 publications to Psychology, 3 documents to Business, Management and Accounting, 2 publications to Economics, Econometrics and Finance, Environmental Science, Decision Sciences, and Computer Science accounted for one document each.
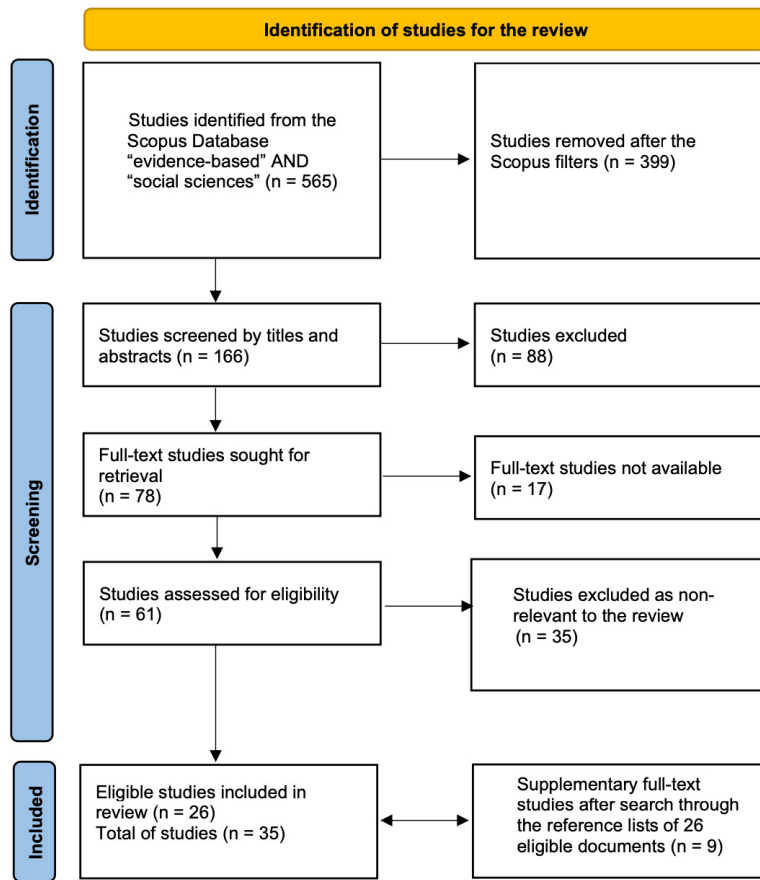
The most cited publications in the review entail two articles on assessment of multiple systematic reviews tools - AMSTAR and AMSTAR-2 (Shea et al., 2007; Shea et al., 2017) with 4751 and 3245 citations respectively as of May 10, 2024. Then followed an article on randomized controlled trials (Deaton & Cartwright, 2018) cited 858 times and an article on the evidence pyramid (Murad et al., 2016) cited 731 times.
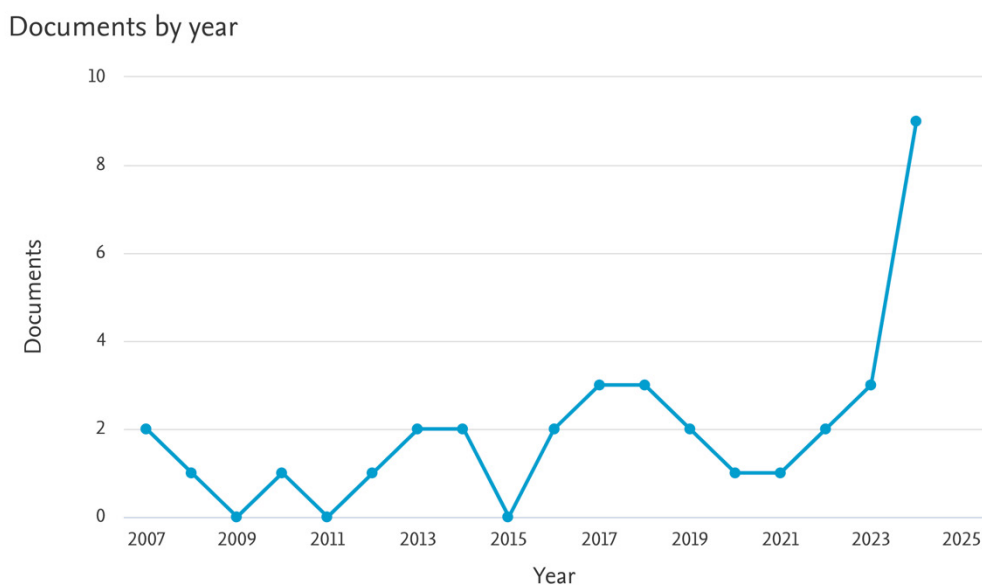
Thematic Clusters

Both authors were to classify the retrieved publications, using the hypothetical thematic clusters. The results were compared. The discrepancies were few. Upon distribution of the studies, the hypothetical thematic clusters were confirmed as adequate and complete. The reviewers classified the papers by clusters, providing particulars in the brackets (Table 3).

Thus, the thematic cluster "evidence-based social sciences" included six publications. Most of the documents (22) in the review were classified as "evidence-based practice". Fourteen publications dealt with hierarchy of evidence. And only

Figure 1

Selection of Publications for the Review

Identification of studies for the review

Identification

Studies identified from the Scopus Database "evidence-based" AND "social sciences" (n = 565)

Studies removed after the Scopus filters (n = 399)

Screening

Studies screened by titles and abstracts (n = 166)

Studies excluded (n = 88)

Full-text studies sought for retrieval (n = 78)

Full-text studies not available (n = 17)

Studies assessed for eligibility (n = 61)

Studies excluded as non-relevant to the review (n = 35)

Included

Eligible studies included in review (n = 26) Total of studies (n = 35)

Supplementary full-text studies after search through the reference lists of 26 eligible documents (n = 9)

Figure 2

Scopus-Indexed Documents on Evidence-Based Social Sciences and Practices by Year (2007-2024)


Documents by year

Note. Scopus Database as of April 27, 2024.

Figure 3

Scopus-Indexed Documents on Evidence-Based Social Sciences and Practices by Country and Territory

Documents by country or territory

Compare the document counts for up to 15 countries/territories.
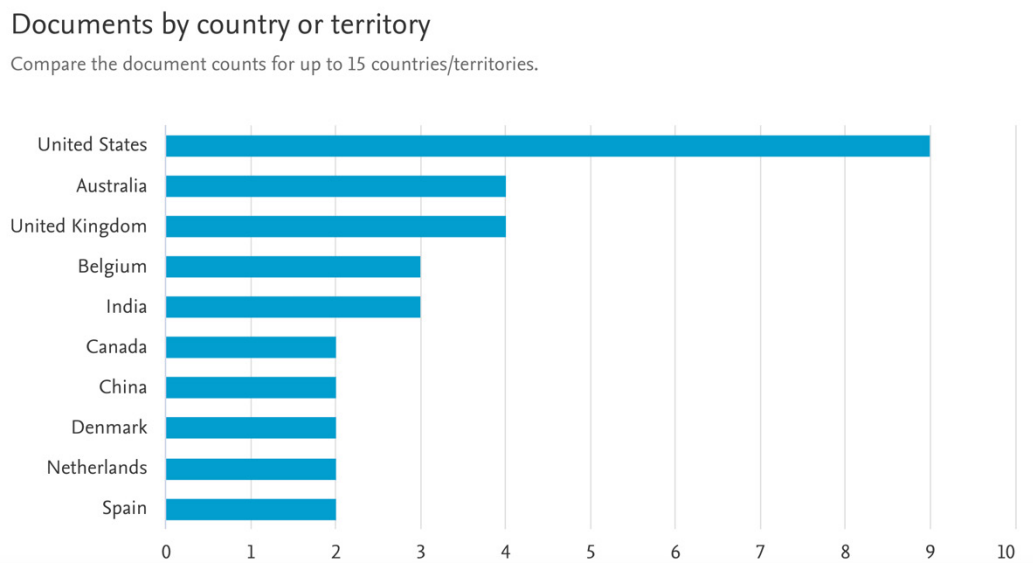
Note. Scopus Database as of April 27, 2024.

	Publications under review	Thematic cluster
1	Bai et al., 2022	evidence (systematic reviews)
2	Boruch & Rui, 2008	EBP evidence
3	Brown et al., 2014	knowledge production evidence
4	Burkhauser & Burkhauser, 2024	EBP (policymaking)
5	Concato, 2013	Evidence EBM
6	De Vincenzo et al., 2024	EBP (across disciplines) EBSS
7	Deaton & Cartwright, 2018	evidence (randomized controlled trials)
8	Drèze, 2018	evidence (randomized controlled trials)
9	Gil-Olivares et al., 2024	EBM (postulates)
10	Goerder et al., 2023	EBP (policymaking)
11	Gray et al., 2013	EBP
12	Haddaway et al., 2016	knowledge production (systematic reviews)
13	Hannes & Claes, 2007	EBP
14	Howlett et al., 2024	EBP (library and information practice)
15	Klose, 2024	EBSS EBP (policing)
16	Krause & Licona, 2020	EBP (policy)
17	Larsen et al., 2019	EBM EBP
18	Luján, 2023	EBP (policy) EBM
19	Mallett et al., 2012	evidence (systematic reviews)
20	Murad et al., 2016	evidence

	Publications under review	Thematic cluster
21	Murdach, 2010	EBP evidence (soft data)
22	Nielsen et al., 2024	EBP (education)
23	Nilendu, 2024	EBP (evidence-based education) EBSS
24	Perez-Gonzalez, 2024	Evidence EBP
25	Schwarz & Tilling, 2009	EBP
26	Shan & Williamson, 2021	EBP+ (policy) evidence
27	Shea et al., 2007	evidence (AMSTAR)
28	Shea et al., 2017	evidence (AMSTAR2)
29	Sheble, 2017	EBP (policy) knowledge production EBSS
30	Tellings, 2017	evidence EBP
31	Watts, 2014	EBP (policy)
32	Weber et al., 2024	EBSS EBP (evidence-based management)
33	White, 2019	EBP (management)
34	White, 2022	EBSS EBP
35	Zapp, 2018	knowledge production

Figure 4

VOSviewer Visualisation of the Review Thematic Clusters
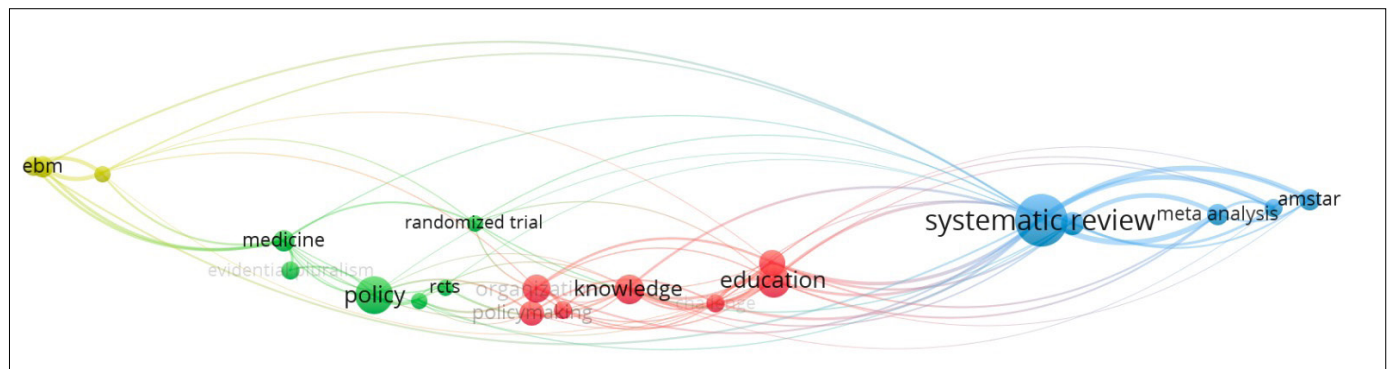
four documents were focused on knowledge production. There were some overlapping as fifteen out of 35 articles were attributed to two or three thematic clusters.

The VOSviewer software's analysis of the metadata from the 35 selected publications mapped out a structured landscape of thematic clusters, each color-coded to denote distinct realms of focus in the field of the review (see Fig.4). The density of terms started from 4. The blue cluster covers synthesis of research: systematic reviews, meta-analyses, AMSTAR (a tool for systematic reviews), methodological quality. The red cluster encompasses the educational and knowledge-production contexts. The green cluster represents issues spread across disciplines from evidence-based medicine. The yellow cluster is also linked to EBM.

Given the difference of the initial inputs, the hypothetical clusters differ from the software clusters. The VOSviewer

analysed only the meta-data of the publications (titles, abstract, authors' keywords), whereas the reviewers considered full-text publications while singling out the thematic clusters. One more aspect that caused a divergency was the overlapping of some publications among the clusters.

Evidence-Based Medicine and Practice Methodology Applicable to Social Sciences

Evidence-based medicine is a fully-fledged field of research (Leach & Veziari, 2022). The methodology and principles of EBM are directly borrowed by other disciplines with some reservations and adaptation. Before proceeding to the specific features of evidence-based social sciences and practices, we consider the review results relating to the concepts, mechanisms and other basics of EBM applicable to social sciences and practices (Table 4).

Evidence-based medicine is a patient-centred decision-making process (Klose, 2024). Evidence-based practice is based on the best research evidence with clinical expertise and patients' values (Sackett et al., 2000; Gray et al., 2013). The EBM major postulates include the relationship of systematic reviews with primary research and their values for decision making; links between the problem and the research type; a comparative low weight of expert opinion in the pyramid of evidence; synthesis of the best evidence lays the foundation of decision making in the context of multiple criteria (Gil-Olivares et al., 2024).

EBM provides for a rigid hierarchy of evidence (Concato, 2013). Recently, it has been the core of heated discissions, with variations of evidence pyramids at the core (Murad et al., 2016; Concato, 2013). Pyramid versions are based on either internal validity (or risk of bias) or external validity (or applicability) (Murad et al., 2016). At present, EBM+ puts forward an epistemological thesis that combines evidence of correlations and evidence of mechanisms complementing each other (Perez-Gonzalez, 2024). Randomized controlled trials (RCT) are supposed to be "the paragon of rigour" and hard evidence among other forms of evidence (Drèze, 2018). RCT is evaluated as an "ideal methodology for casual interference" (Deaton & Cartwright, 2018).

Systematic reviews and meta-analyses play an essential role in EBM, being at the top of evidence pyramids. Several publications in the review dwell upon systematic reviews (Murad et al., 2016; De Vincenzo et al., 2024) in EBM, their placement in evidence pyramids and assessment tools for systematic reviews – AMSTAR and AMSTAR 2 (Shea et al., 2007; Shea et al., 2017). The latter are employed to assess systematic reviews.

Research Area of Evidence-Based Social Sciences and Practices

The publications on evidence-based social sciences and practices are diverse and focus on various aspects of the knowledge production and synthesis (Luján, 2023; Sheble, 2017), evidence-based methodology in social sciences (Tellings, 2017; Mallett et al., 2012; Hannes & Claes, 2007; Haddaway et al., 2016), evidence revolution (White, 2019), discipline-related issues of evidence-based practices (Table 5). The results of the review on evidence-based social sciences and practices are presented in Appendix 2.

The transfer from academic, disciplinary and mainly university-based science that is defined as Mode 1 Science to applied and diverse production of knowledge called Mode 2 Science result in merging networks of science stakeholders, including all-level governments, think tanks, activist groups and universities (Zapp, 2018). In the new environment, new types of science emerge in addition to tradition academic science. As opposed to academic science discourse is concentrated around evidence-based science and regulatory science.

Evidence stands out in the reviewed studies on evidence-based social sciences and practices as the core of the methodology. White (2019) highlights the waves of evidence revolution witnessed for over 30 years in public management in the United States and the United Kingdom. The latest period is marked with institutionalization of the use of evidence through newly established "knowledge brokering agencies" (White, 2019). Evidence-based practices in public management and policymaking is gaining popularity across many countries, though the reviewed papers outline its exceptional spread in "the Anglosphere" (Klose, 2024) and Scandinavian countries (Schwarz & Tilling, 2009).

The recent publications put forward evidential pluralism in basic social science research (Shan & Williamson, 2021). Though, there are many disputable issues regarding evidence and its hierarchy in social sciences. Evidence is separated from the notions of "truth", "knowledge", and "proof" (Biesta, 2010; Oancea & Pring, 2009). Telling (2017) maintains that "evidence" may be expressed as observable data but "in philosophical reasoning" arguments serve as evidence. In legal research, previous judgements are treated as evidence (Tellings, 2017).

Evidence is hard data in EMB. It is measurable and quantifiable (Graziano & Raulin, 1997). In most social science research, soft data of various categories are of great importance in decision making, including accounts, explanations, interpretations, arguments, non-verbal communication (Murdach, 2010).

In an attempt to build evidence-grading schemes in social sciences, since the 1990s many institutions have been set up to address efforts to generate sound evidence. They entail Cochrane Collaboration (health); Campbell Collaboration (education, crime, welfare); Society for Prevention Research

Table 4

Evidence-Based Medicine and Practice Methodology Applicable to Social Sciences and Practices Extracted from the Reviewed Documents

	Key Ideas & Concepts	Evidence-based medicine and practice basics (raw data)	Extracted from
1	Evidence-based medicine	Evidence-based medicine, thus, became early on associated with a process of clinical decision-making which emphasizes the need to combine research evidence and practical expertise. A few years later, this definition was further amended to position evidence-based medicine more clearly as a patient-centred decision-making process...	Klose, 2024
2	Major postulates of evidence-based medicine	4 new postulates for better use of scientific evidence in medical decision-making: (1) Systematic review synthesizes available scientific evidence methodologically but is no better than primary studies. (2) Each problem in the field of health care corresponds to a suitable type of research to generate a solution. (3) Expert opinion is not a type of scientific evidence but could be transferred to the scientific evidence through its methodological systematization. (4) The decision-making proposed by the Evidence-Based Medicine follows 2 moments: first, the synthesis of the best-available scientific evidence and, second, the formulation of decisions through the consideration of multiple criteria.	Gil-Olivares et al., 2024
3	Evidence in EBM	A rigid hierarchy of these design types is a fairly recent phenomenon, promoted as a tenet of "evidence-based medicine," with randomized controlled trials receiving gold-standard status in terms of producing valid results. Although randomized trials have many strengths, and contribute substantially to the evidence base in clinical care, making presumptions about the quality of a study based solely on category of research design is unscientific. Both the limitations of randomized trials as well as the strengths of observational studies tend to be overlooked when a priori assumptions are made...	Concato, 2013
4	Evidence in EBM	The spectrum of medical research includes studies in patient-oriented (non-laboratory) research that focus on an intact person or patient as the unit of observation. Patient-oriented research relies on the basic science of clinical epidemiology, and individual studies are often described using terms such as outcomes research or health services research. One of the assertions of EBM—in part due to problems arising from historical, controlled trials —is the inherent inferiority of observational studies compared with RCTs, because of confounding (susceptibility bias). Although this dogma is now firmly established, various questions have been raised regarding its legitimacy...	Concato, 2013
5	Types of evidence	...the 'commonly shared guidelines' put evidences in the following order of relevance: systematic reviews of well-designed studies (including meta-analyses), group research designs that have a high degree of internal validity, group research designs that have shortcomings in addressing threats to internal validity, case studies, and only on the lower levels of the hierarchies, experts' opinion (Hunsley, 2007).	De Vincenzo et al., 2024
6	A pyramid of evidence	A pyramid has expressed the idea of hierarchy of medical evidence for so long, that not all evidence is the same. Systematic reviews and meta-analyses have been placed at the top of this pyramid for several good reasons. However, there are several counterarguments to this placement. Not all evidence is the same.	Murad et al., 2016
7	Evidence of correlations and evidence of mechanisms	The theoretical core of EBM+ is the Russo-Williamson thesis (Russo & Williamson, 2007). According to this epistemological thesis, both evidence of correlations and evidence of mechanisms are normally needed to establish a causal claim in medicine. It is argued that evidence of correlations and evidence of mechanisms complement each other. Evidence of correlations addresses the major weaknesses of evidence of mechanisms, and vice versa...	Perez-Gonzalez, 2024
8	Randomized controlled trials	In evidence-based practice, randomized controlled trials (RCTs) are presented as a crucial method for establishing causal relationships and assessing the efficacy of policy interventions.	Perez-Gonzalez, 2024
9	Evidence-based practice	Evidence-based practice (EBP) enhances the quality of healthcare, reduces the cost, improves patient outcomes, empowers clinicians, and is recognized as a problem-solving approach (Mazurek Melnik & Fineout-Overholt, 2019)	Nielsen et al., 2024

	Key Ideas & Concepts	Evidence-based medicine and practice basics (raw data)	Extracted from
10	Various versions of the evidence pyramid	The placement of systematic reviews at the top had undergone several alterations in interpretations but was still thought of as an item in a hierarchy. Most versions of the pyramid clearly represented a hierarchy of internal validity (risk of bias). Some versions incorporated external validity (applicability) in the pyramid by either placing N-1 trials above RCTs (because their results are most applicable to individual patients) or by separating internal and external validity. Another version (the 6S pyramid) was also developed to describe the sources of evidence that can be used by evidence-based medicine (EBM) practitioners for answering foreground questions, showing a hierarchy ranging from studies, synopses, synthesis, synopses of synthesis, summaries and systems. This hierarchy may imply some sort of increasing validity and applicability although its main purpose is to emphasise that the lower sources of evidence in the hierarchy are least preferred in practice because they require more expertise and time to identify, appraise and apply. Other barriers challenged the placement of systematic reviews and meta-analyses at the top of the pyramid. For instance, heterogeneity (clinical, methodological or statistical) is an inherent limitation of meta-analyses that can be minimised or explained but never eliminated (Berlin, 2014). The methodological intricacies and dilemmas of systematic reviews could potentially result in uncertainty and error (Dechartres et al., 2014).	Murad et al., 2016
11	Randomized controlled trials	Once upon a time, "evidence" was widely confused with randomized controlled trials (RCTs). The latter were held to be the paragon of rigour, and other forms of evidence, though not necessarily dismissed, were certainly devalued. Whenever observation, experience, reasoning or even statistical analysis suggested one thing and some RCT another, there was a tendency to assume that the RCT got it right. If not with evidence tout court, RCTs became synonymous with "rigorous evidence" or "hard evidence". The privileged status of RCTs was expressed in statements such as "all too often development policy is based on fads, and randomized evaluations could allow it to be based on evidence" (Duflo & Kremer, 2005, 206).	Drèze, 2018
12	Randomized controlled trials	Randomized controlled trials (RCTs) are widely encouraged as the ideal methodology for causal inference. This has long been true in medicine. It is also increasingly true in other health sciences and across the social sciences, including psychology, economics, education, political science, and sociology... The literature on RCTs in these areas are overlapping but often quite different; each uses its own language and different understandings and misunderstandings characterize different fields and different kinds of projects...	Deaton & Cartwright, 2018
13	Evidence-based practice	Evidence-Based Practice (EBP) is based on the notion of a linear model of knowledge production and transfer whereby research findings (knowledge in the knowledge transfer literature) produced in one location is transferred to the context of use through various mechanisms, such as the development of intervention guidelines or treatment protocols. Hence there are various steps in this linear process from knowledge development, generation, or production to knowledge translation, transfer, diffusion, dissemination, and utilisation or implementation in practice (Graham et al., 2006)... Central to EBP, however, is the need for critical appraisal of the nature and strength of research evidence, as well as the impact of contextual features in the practice setting.	Gray et al., 2013
14	Defining evidence-based practice (EBP)	Sackett et al.'s (2000) definition of EBP as a process of clinical decision-making entails 'the integration of best research evidence with clinical expertise and patient values' (p. 1) involving five steps: Convert one's need for information into an answerable question. Locate the best clinical evidence to answer that question. Critically appraise that evidence in terms of its validity, clinical significance, and usefulness. Integrate this critical appraisal of research evidence with one's clinical expertise and the patient's values and circumstances. Evaluate one's effectiveness and efficiency in undertaking the four previous steps, and strive for self-improvement.	Gray et al., 2013
15	AMSTAR 2 (A MeaSurement Tool to Assess systematic Reviews)	The revised instrument (AMSTAR 2) retains 10 of the original domains, has 16 items in total (compared with 11 in the original), has simpler response categories than the original AMSTAR, includes a more comprehensive user guide, and has an overall rating based on weaknesses in critical domains...	Shea et al., 2017

	Key Ideas & Concepts	Evidence-based medicine and practice basics (raw data)	Extracted from
16	Architecture of evidence-based practice	According to the Sicily statement group, teaching and practicing EBP requires a 5-step approach: 1) pose an answerable clinical question (Ask), 2) search and retrieve relevant evidence (Search), 3) critically appraise the evidence for validity and clinical importance (Appraise), 4) applicate the results in practice by integrating the evidence with clinical expertise, patient preferences and values to make a clinical decision (Integrate), and 5) evaluate the change or outcome (Evaluate /Assess) (Dawes et al., 2005; Larsen et al., 2019).	Nielsen et al., 2024
17	Improvement in students' EBP knowledge via interventions	...multifaceted interventions with a combination of lectures, computer lab sessions, small group discussion, journal clubs, use of current clinical issues, portfolios and assignments lead to improvement in students' EBP knowledge, skills, attitudes, and behaviors compared to single interventions or no interventions (Young et al., 2014; Bala et al, 2021).	Nielsen et al., 2024
18	AMSTAR (A MeaSurement Tool to Assess systematic Reviews)	A 37-item assessment tool [for systematic reviews] was formed by combining 1) the enhanced Overview Quality Assessment Questionnaire (OQAQ), 2) a checklist created, and 3) three additional items recently judged to be of methodological importance.	Shea et al., 2007

Committee on Standards; What Works Clearinghouse (WWC) of the US Department of Education; National Registry of Evidence Based Programs and Practices (substance abuse); Blueprints for Violence Prevention (juvenile justice and delinquency); Coalition for Evidence Based Policy; California Evidence-Based Clearinghouse for Child Welfare; and Best Evidence Encyclopedia (education) (Boruch & Rui, 2008).

In EBM, randomized controlled trials have the highest standard in terms of valid results (Concato, 2013). But it is not the case in social sciences where the focus of the research is on methods and assumptions required to apply specific methodology (Brown et al., 2014). In contrast with biological properties in EBM research, social sciences are subject to human choices. Though, social sciences occasionally include research relating to participants (population) and may incorporate RCT, they are far from clinical decision-making. Whereas EBM widely discusses evidence pyramids, offering their variations (Murad et al., 2016), in social sciences a constant trend towards generating evidence-grading schemes prevails as shown above (Boruch & Rui, 2008) that include specific evidence (i.e. evidence from quasi-experiments).

Like EBM, evidence-based social sciences and practices give credit and pay much attention to systematic reviews as "a vital means" of knowledge synthesis. Reviews of evidence also include systematic maps (Haddaway et al., 2016). The latter reliably catalogue evidence on specific topics. Both systematic reviews and systematic maps collate and analyse the available publications containing research evidence related to an issue, an objective, or a subject. Evidence-based practices advocate the use of research synthesis (systematic reviews and meta-analysis) to lower potential bias and distortions in the knowledge production (Hannes & Claes, 2007). Though, systematic reviews may exacerbate information overload (Riaz et al., 2016). They occasionally suggest that the quality of research under review is uneven (Tian et al., 2017).

Few studies discuss weaknesses and challenges that systematic reviews face (Mallett et al., 2012). Evidence-based practices proved that systematic reviews may suffer from inadequate or incomplete analysis, subjective screening and other drawbacks (Shea et al., 2017). But some criticism sounds contradictory. A limited access to databases in southern research organisations, inevitable subjectivity in the screening process, and low quality of research to be included in systematic reviews and meta-analysis are issues of doubt (Mallett et al., 2012). To conclude, research syntheses are greatly varied across social sciences as compared with clinical medicine (Sheble, 2017).

Social Science Practices by Sectors

The studies under review were also analysed by sectors to find the discrepancies and shared approaches to evidence-based practices. The results include the following practices: evidence-based education, evidence-based management, evidence-based policymaking, evidence-based library and information practice, evidence-based policing, and evidence-based economics (Table 5).

Education became of the first sectors where evidence-based practices were more or less widely introduced and accepted. The best practices are used to inform teaching and learning (Betts et al., 2019). Some authors report that an evidence-based education system promotes evidence evaluation (Nilendu, 2024). Evidence-based education (EBE) stick to a set of principles, including integration of research evidence into education (Shumba, 2015); the emphasis on critical thinking and problem-solving skills enabling students to analyze and assess evidence systematically (Prince, 2004). Spencer et al. (2012, p. 129) evolved the definition of evidence-based medicine as a decision-making process into the definition of evidence-based education where this process combines "the best available evidence, professional judgement, and clients' values..." (Spencer et al., 2019; Klose, 2024).

As for evidence in EBE and other social science practices, Veerman & Van Yperen (2007) singled out four levels, including "descriptive, theoretical, indicative, and causal". They found that each level of evidence lead to "potential, plausible, functional, and factual effectiveness of interventions respectively" (Veerman & Van Yperen, 2007).

Using the best available evidence from multiple sources, evidence-based management extract it by asking, acquiring, appraising, aggregating, applying, and assessing (Barends & Rousseau, 2018; Weber et al., 2024). Howlett et al. (2024) synthesize the evidence-based library and information practice process in the same vein, specifying "articulating questions, collecting, interpreting, and applying valid, reliable, and relevant evidence to support decision-making".

Evidence-based policymaking is one of the most spacious sectors of evidence-based practices: it has at least one academic journal (Evidence and Policy), a number of think-tanks across several countries (Watts, 2014) and within governmental agencies in Chile, South Africa, the UK, Mexico (Krause & Licona, 2020), the EU (Perez-Gonzalez, 2024), and many OECD countries (Zapp, 2018). Policy sectors are informed by scientific advice (Zapp, 2018) "to avoid biases, flawed reasoning …" (Perez-Gonzalez, 2014). Burkhauser & Burkhauser (2024) outlined the steps (stages) that describe evidence-based policymaking in the US: creating and disseminating the data required for policy researchers to produce evidence; dissemination of evidence in the academic journals and academia; the US policy research institutes contributing to the academic policy literature by researchers from outside-the-Beltway policy research institutes affiliated with universities but also adding to policy debates inside the Beltway[1]; mature members of the Council of Economic Advisers giving advice to the US President (Burkhauser & Burkhauser, 2024).

Some studies under review contain criticism of evidence-based policymaking. Political risks linked to "allowing outside experts to scrutinize organizational practices" (Goerder et al., 2023) are connected with a potential discovery of sub-par performance (Carpenter 2014; Levine, 2020; Moffitt, 2010). Watts (2014) points to a prevailing opinion that policymaking needs evidence explaining conceptual muddle and doubts the proposition that policymaking should be evidence-based.

Evidence-based policing and evidence-based economics are approached in few studies included in the review. Evidence-based policing as "a new paradigm" aimed at better police performance and public safety (Sherman, 1998; Klose, 2024). It has gained popularity especially in the Anglophone countries[2]. Issues connected with evidence are treated in policing in the same mode other social science practices follow (Klose, 2024). Brown et al. (2014), the only economics-related research in the review, focus on replication research in evidence-based economics that help validate policy-related findings. The issue is of great importance especially for low- and middle-income countries, according to the authors.

Table 5

Evidence-Based Social Science Practices by Sectors in the Reviewed Documents

Evidence-based social sciences practices (raw data) by sectors Evidence-Based Education	Extracted from
1	Evidence-based education emphasizes the use of empirical evidence, research findings, and best practices to inform teaching and learning processes (Betts et al., 2019).	Nilendu, 2024
2	An evidence-based education system (EBES) promotes critical thinking skills, evidence evaluation, and the application of scientific principles in forensic analysis (Meilia et al., 2018).	Nilendu, 2024
3	One key principle [of evidence-based education] is the integration of research evidence into educational practices (Shumba 2015). This involves using empirical evidence, scholarly research, and best practices to inform instructional strategies, curriculum development, and assessment methods in forensic education (Cook et al. 2008).	Nilendu, 2024
4	Another principle [of evidence-based education] is the emphasis on critical thinking and problem-solving skills, which encourages students to analyze and evaluate evidence systematically and logically (Prince, 2004).	Nilendu, 2024
5	Evidence-based education also promotes learner-centered approaches, where students actively engage in their learning process through hands-on activities, collaborative projects, and case-based learning (Hmelo-Silver, 2004).	Nilendu, 2024

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[1]   The Beltway is a colloquialism that embodies policymakers and politicians in Washington, D.C. portrayed as interested only in what happens within the confines of the highway circling the city.

[2]   For instance, the *What Works Center for Crime Reduction* in the UK and the *Center for Evidence-Based Crime Policy* at George Mason University in the USA.

	Evidence-based social sciences practices (raw data) by sectors **Evidence-Based Education**	Extracted from
6	Additionally, evidence-based education encourages the use of technology-enhanced learning tools, such as virtual simulations and interactive multimedia resources, to enhance student engagement and facilitate active learning (Mayer, 1997).	Nilendu, 2024
7	Evidence-based principles can be applied in forensic education by incorporating real-world case studies, mock crime scenes, and practical laboratory exercises (Egger, 2019).	Nilendu, 2024
8	Drawing directly on evolving definitions of evidence-based medicine, Spencer et al. (2012, p. 129), for instance, defined evidence-based practice in education 'as a decision-making process that integrates (1) the best available evidence, (2) professional judgment, and (3) client values and context'…	Klose, 2024
9	The implementation of evidence-based education may face challenges, including resistance to change, lack of faculty training and support, and limited resources (Chisum, 2019)…	Nilendu, 2024
10	Recognizing that students have diverse learning styles, it is crucial to tailor evidence-based practices to cater to visual, auditory, and kinaesthetic learners…	Nilendu, 2024
11	… explaining that RCTs are not always possible in educational practice for financial, methodological, or practical reasons and that the number of RCT-evaluated and proven effective interventions is still very low (Veerman & Van Yperen, 2007). Moreover, positive results are often flattered and studies often take place in controlled environments that do not resemble actual practice.	Tellings, 2017
12	… four levels of evidence (Veerman & Van Yperen, 2007): descriptive, theoretical, indicative, and causal, which lead to potential, plausible, functional, and factual effectiveness of interventions, respectively. Each level has its accompanying parameters of evidence and types of research. RCTs are at the highest, causal level and, for instance, observational studies are at the lowest, descriptive level. Studies should take interventions in actual practice as a starting point and decide based on these which research design is feasible.	Tellings, 2017
13	Evidence-Based Management	
14	It is based on the idea that good-quality management decisions require both critical thinking and use of the best available evidence. Evidence-based management is about making decisions through the conscientious, explicit and judicious use of the best available evidence from multiple sources by: 1. Asking: translating a practical issue or problem into an answerable question. 2. Acquiring: systematically searching for and retrieving the evidence. 3. Appraising: critically judging the trustworthiness and relevance of the evidence. 4. Aggregating: weighing and pulling together the evidence. 5. Applying: incorporating the evidence into the decision-making process. 6. Assessing: evaluating the outcome of the decision taken to increase the likelihood of a favorable outcome (Barends & Rousseau, 2018).	Weber et al., 2024
15	Evidence-Based Policymaking	
16	The central idea of this movement is that policy-making should be guided by the best available evidence… EBP is inspired by the evidence-based medicine (EBM) approach. In fact, EBP was initially introduced as the direct application of the EBM methods to policy-making.	Perez-Gonzalez, 2024
17	It has been applied to diverse areas such as development economics, crime prevention, education, housing policy, and criminal justice. Furthermore, EBP has achieved considerable relevance and influence in the US, the EU, and the UK.	Perez-Gonzalez, 2024
18	In 2013, for example, the British government established the What Works Network. This network aims to expand and consolidate the evidence-based approach in diverse areas of social policy. It integrates several centres such as The What Works Centre for Local Economic Growth, The Education Endowment Foundation, and The What Works Centre for Wellbeing.	Perez-Gonzalez, 2024
19	EBP aims to avoid biases, flawed reasoning, and misplaced goodwill in decision-making, which have been responsible for many undesired outcomes in the past.	Perez-Gonzalez, 2024

	Evidence-based social sciences practices (raw data) by sectors Evidence-Based Education	Extracted from
20	The first step necessary for evidence-based policymaking is to create and disseminate the under-lying data necessary for policy researchers to produce and provide such evidence. The second step …is the policy research found in the disciplinary journals of the academic research community and written for that academic community using these data. [The third step] … the additional role that United States policy research institutes play by not only contributing to the academic policy literature (especially by researchers from outside-the-Belt-way policy research institutes primarily affiliated with universities) but also to current policy debates inside the Beltway. The fourth step. The Maturation of CEA Members Giving Advice to the President. Policy research institutes in the United States …play important roles in the creation of evidence for evidence-based policymaking via contributions to peer-reviewed publications but, more frequently, in evaluating current policy issues and providing economic analysis of the behavioural and distributional consequences of those current policies.	Burkhauser & Bur-khauser, 2024
21	The political risks associated with allowing outside experts to scrutinize organizational practices – for example the discovery of sub-par performance, or even misconduct – are substantial, especially for poorly functioning organizations (Carpenter 2014; Levine 2020; Moffitt 2010).	Goerder et al., 2023
22	…the two principal characteristics of regulatory science (as opposed to academic science) are: (1) that in regulatory science the objective is providing advice for decision making, and (2) the involvement of regulatory agencies (government institutions). The remainder of differences between these two types of science flow from those two characteristics… The regulation of technology is the best example of using scientific knowledge in the shaping, application, and evaluation of regulations and public policies, albeit specifically limited to areas related to technology. In contrast, evidence-based policies are: (1) merely proposals, at least for now and (2) there are currently no government agencies (as in the case of technology regulation) that commission any relevant scientific research.	Luján, 2023
23	Virtually all policy sectors are now informed by scientific advice, allowing some areas like health, social policy, and education to witness a distinctive 'evidence turn' during the past two decades in many OECD countries; organizations like the Campbell Foundation and Cochrane have also been founded to assure such knowledge transfer and application (Zapp & Powell, 2016).	Zapp, 2018
24	There is at least one academic journal (Evidence and Policy) devoted to promoting evidence-based policy. Major think-tanks like the Coalition for Evidence-Based Policy in the US, the Centre for Evidence-Based Policy and Practice, and the Campbell Collaboration in the UK, and Australia's Productivity Commission have all endorsed evidence-based policy strongly.	Watts, 2014
25	…anyone attending to the evidence-based policy literature closely will almost immediately notice that no one seems to entertain seriously the proposition that policy could –or should-ever be only 'evidence-based'. More common is the idea that greater use should be made of evidence which may explain some of the evidence of conceptual muddle. This may explain why it is never clear whether 'conceptualisations' of evidence-based policy are descriptive, normative or simply exhortatory…	Watts, 2014
26	Since the 1990s, most efforts to institutionalize the use of evidence in government have aimed at informing policy formulation in a structure manner. Evaluation (and monitoring) units have been created in ministries of finance (as in Chile), the president's or prime minister's office (South Africa and the UK, respectively), and elsewhere in government (as in Mexico).	Krause & Licona, 2020
27	Evidence-Based Library and Information Practice	
28	Evidence-based practice is an approach to continuously improving professional practice that involves a structured process of articulating questions, collecting, interpreting, and applying valid, reliable, and relevant evidence to support decision-making (Howlett & Thorpe, 2018).	Howlett et al., 2024
29	The evidence-based library and information practice process (arguably) has five steps – articulate, assemble, appraise, apply, assess (Koufogiannakis & Brettle, 2016; Thorpe, 2021). However, Thorpe (2021) recently added 'communicate' as a necessary addition to the well-established '5 A's process'.	Howlett et al., 2024
30	Evidence-Based Policing	
31	Evidence-based policing is 'a decision-making process which integrates the best available evidence, professional judgement and community values, preferences and circumstances'	Klose, 2024
32	Evidence-based policing is 'a new paradigm for police improvement and for public safety' (Sherman, 1998, p. 2).	Klose, 2024
33	…This new paradigm, building on Goldstein's problem-oriented policing, promotes the 'use of the best available research on the outcomes of police work to implement guidelines and evaluate agencies, units and officers' (Sherman, 1998, p. 3).	Klose, 2024

	Evidence-based social sciences practices (raw data) by sectors Evidence-Based Education	Extracted from
34	...evidence-based policing has gained significant popularity, particularly in the Anglosphere. Its rise has led to the creation of professional societies and educational programmes in several countries, and become particularly associated with institutions like the What Works Center for Crime Reduction in the UK and the Center for Evidence-Based Crime Policy at George Mason University in the USA; ... initiatives such as the creation of an Evidence-Based Policing Matrix (a tool designed to translate research into practice), the launch of the Cambridge Journal of Evidence-Based Policing, or the establishment of an Evidence-based Policing Hall of Fame.	Klose, 2024
35	...proponents for evidence-based policing have promoted different understandings of what passes for best available evidence, which in turn has created considerable conceptual confusion... this article holds that the usage of best available evidence implies the competent review and identification of the most reliable evidence relevant for a particular decision...	Klose, 2024
36	...evidence-based policing as a decision-making process in which practitioners with equal rigour consider not only the best available evidence but also the values, preferences, and circumstances of affected communities.	Klose, 2024
37	Evidence-Based Economics	
38	Replication research to validate policy-relevant findings is important for all research that is used to inform policy and practice. ... internal replication research is a crucial element in the production of evidence for evidence-based policymaking, especially in low- and middle-income countries. Despite some evidence of codified replication policies and a growing conceptual interest in the practice, replication research remains an underused tool in social science and international development.	Brown et al., 2014
39	Original authors usually have the most to lose and the least to gain from a replication study of their work, causing them to resist requests for data and code from replication researchers... A replication study that validates the original results should build an original author's reputation, but that only works to the extent that these replication studies are published and publicised. A replication study that refutes the findings or policy recommendations of the original study may not just call into question the original study but also other studies by the same original authors.	Brown et al., 2014
40	Around the turn of the century, three journals – Journal of Political Economy, Empirical Economics and Labour Economics – attempted to promote and publish replication studies but their efforts were generally short lived because of a lack of interest (Hamermesh, 2007, p.723).	Brown et al., 2014

DISCUSSION

The results prove that the research field of evidence-based sciences and practices exists, showing some signs of cohesion. The evidence-based methodology in social sciences was substantially borrowed from EBM, with some issues being adapted and others non-applicable being omitted. The current review findings show that there are no complex and comprehensive studies covering evidence-based methodology applicable to social sciences. The discourse in social sciences gravitates toward individual sectors and disciplines. Only few publications attempted to approach evidence-based social sciences as an emerging research field (White, 2019; White, 2022; Zarghi & Khorasani, 2018). They dwell upon some issues without a profound analysis of the emerging research area. Zarghi & Khorasani (2018) published an opinion piece, with an accent mainly on social work. Evidence-based practice is defined there through the "asking-acquiring-appraising-aggregating-applying-assessing" framework, whereas evidence-based social sciences are described as a new paradigm promoting "more effective social interventions" by the use of the best available scientific evidence in profession decision making (Zarghi & Khorasani, 2018). Though, definitions were offered without an analysis of the existing definitions or philosophical rationale. The afore-mentioned publications by H.White consider the emergence of the major components in China' evidence-based social sciences (White, 2022); and the four waves of evidence revolution (White, 2019).

The review outlined two approaches to evidence-based science and practice. First, it does not go farther than proposals at least for now and no governmental agencies that commission special research for forging new policies (Luján, 2023). Regulatory science aims to work out advice for decision making, and it involves regulatory agencies (Luján, 2023). Second, other authors imply involvement of governmental agencies in evidence-based practices (Lionardo et al., 2024; Pizard et al., 2023) and occasionally use the term "evidence-based science" in the meaning of "regulatory science". Further searches have not retrieved any papers on the distinctions between these two terms. Publications on regulatory science study it as a paradigm (Hilton et al., 2023) or from the point of view that the public effects of any technology must be overwhelmingly examined. Evidence-based science mainly exists separately. The two concepts have little in common. Thus, regulatory science in beyond the research field of evidence-based social sciences and practices.

Both EBM and evidence-based social sciences have their bottlenecks and concepts that ignite heated discussions and varieties of stances: for instance, evidence pyramids in EBM (Murad et al., 2016); RCT and soft data in evidence-based social sciences (Deaton & Cartwright, 2018; Humphries, 2003; Shan & Williamson, 2021; Murdach, 2010).

The thematic clusters identified by the authors as a hypothesis proved to embrace all the reviewed publications. Most publications (22 out of 35) represent research on evidence-based practices. The sparsity of publications on evidence-based social sciences, i.e. methodology and architecture of evidence-based social sciences (4 studies) proved our claim regarding the existing fragmentation of the research field of evidence-based social sciences. The articles in the review are essentially grouped by sectors and disciplines. The scientific disputes also centre around those disciplines and sectors. All studies of general nature originate from EBM. Thus, at present there is no consistent evidence-based methodology for all social sciences and practices.

CONCLUSION

The review findings gave detailed answers to the research questions. The aim of the review was attained. The results add to the emerging field of evidence-based social sciences and practices, aligning our perceptions of evidence in social sciences, their hierarchy, types of evidence, the place of expert opinion and research synthesis in the architecture of evidence-based sciences. The insights into evidence-based science imply more efficient evidence-based practices. The findings could cause more systematic examination of the research field and help develop more elaborate evidence-based methodology for social sciences.

The key limitations of this review are connected to the selection of studies. To get more comprehensive results, the reviews might have interrogated other databases where social sciences are well presented. Possible omission of relevant studies might have occurred due to the exclusion of non-English language studies.

The review outcomes ought to prompt the academic community into studying evidence-based social sciences and practices further. With all rigour and depth of the reviewers in this paper, in further research, the sampling should be re-invented and widened to identify more studies on individual disciplines (evidence-based policymaking, education, policing, social work, managements and other fields where evidence-based methodology is applicable). It may help classify shared components of evidence-based methodology in various disciplines and sectors, outline the divergencies as well as particular or unique features. Scoping and then systematic reviews in individual evidence-based sciences may be valuable in this respect.

DECLARATION OF COMPETING INTEREST

None declared.

AUTHORS' CONTRIBUTION

Elena Tikhonova: conceptualization, data curation, formal analysis, investigation, methodology, resources, software, validation, visualization, writing – original draft, writing – review & editing.

Lilia Raitskaya: conceptualization, data curation, formal analysis, investigation, methodology, resources, software, validation, visualization, writing – original draft, writing – review & editing

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APPENDIX 1. THE REVIEWED DOCUMENTS

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APPENDIX 2

Evidence-Based Methodology in Social Sciences in the Reviewed Documents

Key Ideas & Concepts	Evidence-based methodology in social sciences (raw data)	Extracted from
Regulatory science vs. academic science	...the two principal characteristics of regulatory science (as opposed to academic science) are: (1) that in regulatory science the objective is providing advice for decision making, and (2) the involvement of regulatory agencies (government institutions). The remainder of differences between these two types of science flow from those two characteristics... The regulation of technology is the best example of using scientific knowledge in the shaping, application, and evaluation of regulations and public policies, albeit specifically limited to areas related to technology. In contrast, evidence-based policies are: (1) merely proposals, at least for now and (2) there are currently no government agencies (as in the case of technology regulation) that commission any relevant scientific research.	Luján, 2023
New production of knowledge (Mode 2 science)	...the 'new production of knowledge' or 'Mode 2 science'(Gibbons et al., 1994; Nowotny et al., 2001). This framework assumes a shift from an academic, disciplinary, and autonomous university-based organization of primarily fundamental knowledge – described as Mode 1 – to a more organizationally diverse, transdisciplinary, applied, and reflexive kind (Mode 2). Proponents of the so-called 'New Production of Knowledge' or 'Mode 2' approach hold that scientific locales multiply and interactions in expanding networks intensify. Joining together the knowledge-producing enterprise are governments, industry, think tanks, consultancies, associations, and activist groups alike, far beyond universities alone.	Zapp, 2018
Evidence revolution	...the evidence revolution, which has unfolded in fours waves over the last 30 years: (1) the results agenda as part of New Public Management in the 1990s, (2) the rise of impact evaluations, notably randomized controlled trials (RCTs) since the early 2000s, (3) increased production of systematic reviews over the last ten years, and (4) moves to institutionalize the use of evidence through the emergence of knowledge brokering agencies, most notably the What Works movement in the United States and the United Kingdom...	White, 2019
Evidence-based practice	EBP is seen as a foundational principle for professionals to continue to learn and maintain theoretical and practical competencies throughout their careers (Babione, 2010; Kazdin, 2008).	Tellings, 2017
Evidence-based practice+	... the move from EBM to EBM+ warrants an analogous move from present-day evidence-based policy (EBP) to EBP+, a new approach to policy appraisal which takes evidence of mechanisms more seriously. Of course, causal claims in the social sciences are not limited to claims about the effectiveness of proposed policy interventions— they also include claims about the causes and effects of societal, economic, legal, geographical, linguistic and psychological phenomena...Evidential Pluralism can be usefully applied to basic social science research, in addition to policy appraisal, because it sheds new light on the evidential relationships involved in establishing causation	Shan & Williamson, 2021
Research synthesis	Use of research synthesis methods has contributed to changes in research practices. In disciplinary literatures, authors indicate motivations to use the methods include needs to (a) translate research-based knowledge to inform practice and policy decisions, and (b) integrate relatively large and diverse knowledge bases to increase the generality of results and yield novel insights or explanations...	Sheble, 2017
Research synthesis	Research synthesis is an empirical research method in which data and findings from primary research studies are analyzed with the goal of generating new knowledge or interpretations. Research synthesis involves formulating a research problem, retrieving relevant literature, evaluating, analyzing, and synthesizing data, and interpreting the results.	Sheble, 2017
Research synthesis	Following the development of contemporary research synthesis methods in the 1970s by psychology and education researchers, such methods, under the labels "systematic review" and "meta-analysis" became an integral component of the evidence-based practice (EBP) movement that revolutionized research use in health and medicine and research practices in education.	Sheble, 2017

Key Ideas & Concepts	Evidence-based methodology in social sciences (raw data)	Extracted from
Reviews as research synthesis	Review publications critically assess prior research in a given area. Reviews include research syntheses such as systematic reviews and other types of reviews such as narrative or historical reviews. Publications with records labeled "Review" in the S/SCI Document Type field are considered reviews. Given that whether there are 100 or more references in a publication is one criteria used to define reviews in the WOS, in some fields, it might be more likely that research syntheses are not categorized as reviews because studies included in a synthesis may not be included in the publication's reference list (Payne et al, 2012)… While the social sciences were the first to engage with the methods, engagement varied greatly across social science fields. In contrast, there was less variation across clinical medicine.	Sheble, 2017
Challenges when conducting systematic reviews	… systematic reviews require access to a wide range of databases and peer-reviewed journals, which can be problematic and very expensive for non-academic researchers and those based in southern research organisations. Promoting systematic reviews as best practice, therefore, sits uneasily alongside donors' interests in developing southern research capacity and in encouraging a more inclusive process of evidence building… In order to achieve objectivity, inclusion and exclusion criteria are used to screen potentially relevant studies. However, there is inevitable subjectivity in the screening process, particularly when high numbers of researchers are involved, as each member of the research team interprets inclusion criteria slightly differently. In our systematic reviews, we classified all studies included in the final analysis according to research design, methodology, data and assumptions made. However, data and methodology are, in general, poorly described in the development studies literature. …due to time and resource constraints, we had to rely on authors' self-proclaimed research design and results, which introduces another source of bias. …our systematic reviews did not generate the practical policy recommendations anticipated. Due to the often low number of studies, inconsistency of methodological approaches and lack of meta-analysis, the findings were often too broad, too incomparable and too research-oriented… There are many research questions of qualitative nature that are inappropriate for a systematic review approach. The challenges of assessing qualitative evidence, however, could mean that systematic reviews continue to focus more strongly on quantitative studies and measurable outcomes than they would otherwise. Randomised controlled trials (RCTs) are considered by many to be the 'gold standard' of development research, but there should be a place for all kinds of research.	Mallett et al., 2012
Systematic reviews in evidence-based practice (EBP) within social fields	Evidence-based practice (EBP) within social welfare, education, criminology, and other related fields of interest becomes a necessity to motivate political and social choices, which should be inspired by rational rather than emotional arguments… Campbell systematic reviews are able to guarantee a more efficient use of scientific findings by policy makers. They provide answers to the question "what works?" and summarize the most important findings. Policy makers with limited time to read may find it easier to read ready-made evidence. Results of systematic reviews focus on measurable effects of social, educative, and criminological interventions. They also reveal gaps in existing research in case no answers to the research question are found. And so, they contribute to and provide guidance in the tough discussions on the assignment of limited funds for scientific research. However, policymakers still have to be careful in generalizing results from systematic reviews.	Hannes & Claes, 2007

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Reviews of evidence: systematic reviews vs systematic maps	Reviews of evidence are a vital means of summarising growing bodies of research. Systematic reviews (SRs) aim to reduce bias and increase reliability when summarising high priority and controversial topics. Similar to SRs, systematic maps (SMs) were developed in social sciences to reliably catalogue evidence on a specific subject. Rather than providing answers to specific questions of impacts, SMs aim to produce searchable databases of studies, along with detailed descriptive information. These maps (consisting of a report, a database, and sometimes a geographical information system) can prove highly useful for research, policy and practice communities, by providing assessments of knowledge gaps (subjects requiring additional research), knowledge gluts (subjects where full SR is possible), and patterns across the research literature that promote best practice and direct research resources towards the highest quality research. The objectives of SMs and SRs are fundamentally similar; to collate and describe all of the available published research evidence on a topic in an objective, repeatable and transparent manner (CEE, 2013). These syntheses aim to be comprehensive and should be undertaken according to an a priori peer-reviewed method (a SM/SR protocol). Publication of a protocol that sets out the planned methodology before the review commences has a number of important benefits.	Haddaway et al., 2016
Evidence	Evidence Biesta (2010) explains that "evidence" is not the same as "truth" or "knowledge" but that it can play a part in justifying true beliefs—justified true belief being one definition of "knowledge" (Biesta, 2010)	Tellings, 2017
Evidence	… "evidence" is not the same as "proof"(Oancea and Pring, 2009). What counts as evidence depends on the type of research undertaken, and this in turn depends on the kind of research question that is asked. According to the authors, observable data could be "evidence" but also arguments (in philosophical reasoning) or previous judgments (in legal research)…	Tellings, 2017
Hard data	… one might say that quantitative designs use hard observable data which can be statistically verified whereas qualitative designs focus more on understanding what they research in other ways…	Tellings, 2017
Social sciences: human choices	In most social science empirical research, much of the focus is on statistical methods and the assumptions needed to justify the use of certain methodologies. The assumptions researchers make, the indicators they select or create to measure social and economic concepts, and the estimation methods they employ, are all human choices and not controlled lab conditions or biological and physical properties.	Brown et al., 2014
Overcoming publication bias	The solution most often recommended for the publication bias challenge is research registration. Registries are only part of the solution though. Most do not require submission of a complete analysis plan, so registrants still have quite a bit of latitude in what they report beyond the basic hypotheses entered into the registration form. Registration is also quite new in the social sciences. Even as journals and funders start to require registration, it will be years before the majority of published articles will have a public registration on file. Replication research is another way to test an article for reporting and publication bias.	Brown et al., 2014
Replication research	Replication research is …[a] way to test an article for reporting and publication bias. …a typology for approaches to internal replication research: pure replication; MEA (measurement and estimation analysis) TCA (theory of change analysis)	Brown et al., 2014
Replication policies in journals	The journals' replication policies are grouped into five categories: confirmed to have no replication policy non-applicable (does not publish original research) or no answer to repeated inquiries about replication policy promotes replication as an important practice but has merely a soft or informal policy has a data accessibility policy with no mention of replication-ready data has a robust replication policy and standards for data accessibility	Brown et al., 2014

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Specific features of social science empirical research	Even accounting for the recent popularity of randomised controlled trials (RCTs) in the social sciences, social science empirical research is not like the medical and natural sciences. In a medical efficacy trial, the focus is on precisely determining and controlling the conditions of the trial so that the result is as simple as a comparison of the observed outcomes. For such trials, validation often comes from external replication (a new trial is conducted on a newly drawn sample of patients) rather than from recalculating the comparison of the outcomes. In most social science empirical research, much of the focus is on statistical methods and the assumptions needed to justify the use of certain methodologies. The assumptions researchers make, the indicators they select or create to measure social and economic concepts, and the estimation methods they employ, are all human choices and not controlled lab conditions or biological and physical properties.	Brown et al., 2014
Categories of soft data	Hard data is typically defined as evidence that is measurable, quantifiable, and subject to verification by test or recognized standards of scientific inquiry (Graziano & Raulin, 1997). Although evidence-based practice methods are desirable, the requirement of such methods for solid scientific data is not currently realizable in many types of direct practice in social work (Reid, 1995). For this reason, most direct service practitioners must still attempt to provide quality service to their clients by relying on less than scientific evidence for most of their clinical decision making (Aisenberg, 2008)... Categories of Soft Data Accounts are clients' "stories" about the events that have brought about their current situations and problems (Neimeyer & Stewart, 2000). Explanations are statements that attempt to clarify why and in what ways the problem, condition, circumstance, or situation in question "exists, . . . or is true" (Moore & Parker, 1986). Interpretations are efforts to make sense of events so that some course of action can be decided on (Gergen, 2002). Arguments, in critical thinking terms, are not contentious debates or disagreements but are, instead, justifications offered by a client that support and rationalize often difficult decisions or plans (Crusius & Channell, 2000; Gambrill, 2006). Broadly defined, nonverbal communication is all aspects of communication "other than words" (Wood, 2002) and can include all nonverbal aspects of social interaction in physical environments, manner of dress, mood, facial expression, rate of speech, gesture, and body language (Kadushin, 1997; Wood, 2002).	Murdach, 2010
Evidence architecture in China: good and bad issues	When China began opening the economy in the mid-70s, it did so through experimentation. Whilst not organized as randomized controlled trials, the government tried out different incentive systems for farmers, firms and workers and learned from the results... To start with the good news, the number of effectiveness studies is increasing... There are also emerging elements of an 'evidence architecture' for the social sciences. Now, for the bad news. First, regarding the research there are three issues: (1) the capacity for primary research remains very uneven, (2) many published papers are of low quality in reporting and methodology, and (3) activities are concentrated amongst a small number of researchers and research institutions...	White, 2022
Systematic reviews and research bias in China	With the enormous expansion in research literature, SRs play an important role in summarizing the findings from bodies of research. However, the rapid increase in the production of systematic reviews has raised concerns about whether reviews themselves are exacerbating information overload (Riaz et al., 2016). As SRs play an important role in the assessment of interventions and guide policy and practice it may be that the focus should be on quality not quantity. In recent years, the number of SRs and meta-analysis studies in China has increased rapidly, but some studies have suggested that the quality is uneven (Tian et al., 2017). Furthermore, there is no research evaluating whether bias exists in research design, implementation and reports, including normative metrics of the title, adequacy of the introduction, clarity of the data sources, adequacy of the data analysis, etc. Similarly, no studies have clearly reported on the topics covered by systematic review and meta-analyses in the social sciences.	Bai et al., 2022

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Evidence-grading schemes in social sciences	...social sciences have witnessed, during the past few decades, a phenomenal growth in applications of modern measurement and statistical techniques but lagged behind in rigorous research designs as efforts to generate sound evidence... A major reason for development of evidence grading schemes is that policy decisions are increasingly based on evidence from empirical studies. The evidence from these studies, or the studies selected as evidence, can be either equivocal or biased. At their best, systematic reviews of evidence based on good evidence grading schemes can reduce the possibility of biases and screen out studies that are equivocal. Since the 1990s, a number of organizations have been created to develop evidence grading schemes...These organizations include: Cochrane Collaboration (health); Campbell Collaboration (education, crime, welfare); Society for Prevention Research Committee on Standards; What Works Clearinghouse (WWC) of the US Department of Education; National Registry of Evidence Based Programs and Practices (substance abuse); Blueprints for Violence Prevention (juvenile justice and delinquency); Coalition for Evidence Based Policy; California Evidence-Based Clearinghouse for Child Welfare; and Best Evidence Encyclopedia (education)... The main scientific presumption is that RCTs, when conducted properly, yield the least equivocal and least biased estimates of the effects of the program under study relative to a control condition or a competing program. However, it is not always possible to mount RCTs to estimate the effects of a program. Consequently, their standards also acknowledge studies that produce more equivocal findings. For instance, the Campbell Collaboration admits quasi-experiments in its evidence standards. Nonetheless, Campbell reviews (and others) are required to separate out the results of randomized controlled trials from the results of the quasi-experiments. Similarly, the WWC in education gives a higher ranking to evidence from well conducted randomized trials than it gives to evidence from well conducted quasi-experiments.	Boruch & Rui, 2008
Evidence-based practice in Sweden	The importance of implementing evidence-based practice (EBP) in social services has been stressed by the Swedish Government in 2008, concluding that existing practice was inadequate and not knowledge-based (Swedish Government Inquiries, 2008, p. 9)... The practice "requires a bottom–up approach that integrates the best external evidence with individual clinical expertise and patients' choice" (Sackett et al., 1996, p. 72). The large-scale, national EBP initiative implemented in Sweden in 2010–2016, aimed to develop an effective, transparent and knowledge-based social service that would benefit the individual service user (Swedish Government, 2010, 2011), was based on EBP knowledge (Eliasson, 2014). Putting available knowledge into practice according to the EBP concept is problematic... Among obstacles are: using a top–down approach; ignoring professional and practical research development (Börjeson and Johansson, 2014); focusing on making research knowledge available to practitioners; having an instrumental and decontextualized view of EBP (Avby, 2018).	Schwarz & Tilling, 2009