REVIEW ARTICLE

Review Typology: The Basic Types of Reviews for Synthesizing Evidence for the Purpose of Knowledge Translation

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ABSTRACT

With advances in medical practice and fields of research, reviews occupy a key position for summarizing existing knowledge. Due to the differences and overlap in terminology, the full potential for reviews may be lost due to confusion of indistinct approaches. The main objective of this study was to provide a descriptive outline of each of the common review types with their characteristics and examples in a health care system. A scoping search was conducted using the keywords associated with the literature review typology. The SALSA (Search, Appraisal, Synthesis and Analysis) analytical framework was used to identify and distinguish each type of review. Nine common types of reviews and associated methodologies were evaluated against the already established SALSA framework. Their description, strengths and weaknesses are presented. The results provided a basic idea of different types of reviews based on the intended level of knowledge synthesis by which researchers can identify the appropriate type of review based on their intended audience.

Key Words: *Types of review. SALSA framework. Strengths. Weaknesses. Evidence-based research.*

INTRODUCTION

What is meant by a literature review? Students, trainees and many others, who may have only recently embarked into the field of research, tend to hesitate when approaching a literature review. They consider it to be only summaries of papers or an extended annotated bibliography.[1] However, the actual value of a literature review is much more than this. Several definitions for a literature review have been proposed. Shaw highlighted the process of a literature review by stating that "it should explain how one piece of research builds on another".[2] Hart defines a literature review as being "the use of ideas in the literature to justify the particular approach to the topic, the selection of methods, and demonstration that this research contributes something new".[3] Webster and Watson define an effective literature review as one of the platforms that "creates a firm foundation for advancing knowledge. It facilitates theory development, closes areas where a plethora of research exists, and uncovers areas where research is needed".[1] On reflecting back to these definitions provided in the literature, it is clear that for a literature review to be effective, it should possess the following characteristics:

a. Provide firm support to a research topic that should be on an important aspect of the field.
b. Use well-defined quality data for synthesis and analysis.
c. Appropriate selection of research methodology.
d. Contribute to the development of a new scope of practice.
e. Highlight the need for further investigation for previously unrevealed areas of interest.

Literature review and its importance: Evidence Based Medicine (EBM) has played a significant role in healthcare since the 1990's. This is particularly prominent with regards to the current practice and guidelines which are key for clinicians, who are increasingly using EBM in their clinical decision-making.[4] On the other hand, the amount of research publications on any health topic in this era of digitalization has grown exponentially. For example, compared to 1991, eight times as many papers were indexed in Web of Science, regarding obesity, in 2008.[5] With such a tremendous number of papers, it would be difficult for a scientist to retrieve key information on a topic of interest, necessitating several months to read each paper in detail.[6] Thus, based on systematically synthesized summaries, the clinician will be able to extract essential information required for evidence-based practice. Some of the reviews available in literature, that were published prior to EBM era, lack formal statistical methods as well as systemization that creates uncertainty about the research findings.[7]

The International Cochrane Collaboration was formed in 1992 to provide expanding resources to the health care industry. Archie Cochrane, considered to be one of the pioneers of the systematic review process, challenged the method of information gathering. According to the author, unorganized critical summary is one of the major inadequacies for evidence-based medicine.[3] Thus began

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the modern era of review articles, aiding many researchers and serving as the mainstay of updated scientific knowledge.[9] In addition, this approach not only summarizes knowledge but also highlights the need for further research on the gaps identified when conducting and writing a literature review.[10]

Writing a literature review (plan and approach): Before writing a review, focus should be made on its importance and significance. Questions should be raised regarding the review that one is undertaking to determine whether it fulfills the need of generating new or redefined concepts on a particular topic of interest, is being written for an awareness of current knowledge, or whether it identifies gaps for future research.[11] It can be of any form, from a "narrative review" to a very "systematically organized review". The following steps are essential for conducting a well-synthesized quality review,[12] as shown in the flow chart below (Figure 1).

Formulating a good research question: It is essential for a review to have a specific, clear and focused question regarding a topic. Being specific in nature will create similar understanding for all the stakeholders involved in a review. A well-formulated question is realistic and manageable in scope, neither too narrow nor too broad, and produces meaningful results. Creating a well-formulated question is a skillful art, which starts with an iterative process and the process of going back and forth between the questions to be addressed and searching for resources is critical. Once the search for resources has begun, it will create a better understanding of research topic to the reviewer, and thus they need to keep an open mind about revisiting or revising the research question. It is important to reflect back on to the question at different stages of a review to produce a more meaningful synthesis. Formulating a research question is a reflective process aimed at collaborating with others involved in the study, in order to reflect the true purpose of work for a desired outcome. A good formulated question requires a "drilling down" approach. It should aim to address the scope of the question, strictly following the inclusion and exclusion criteria for the study.[13]

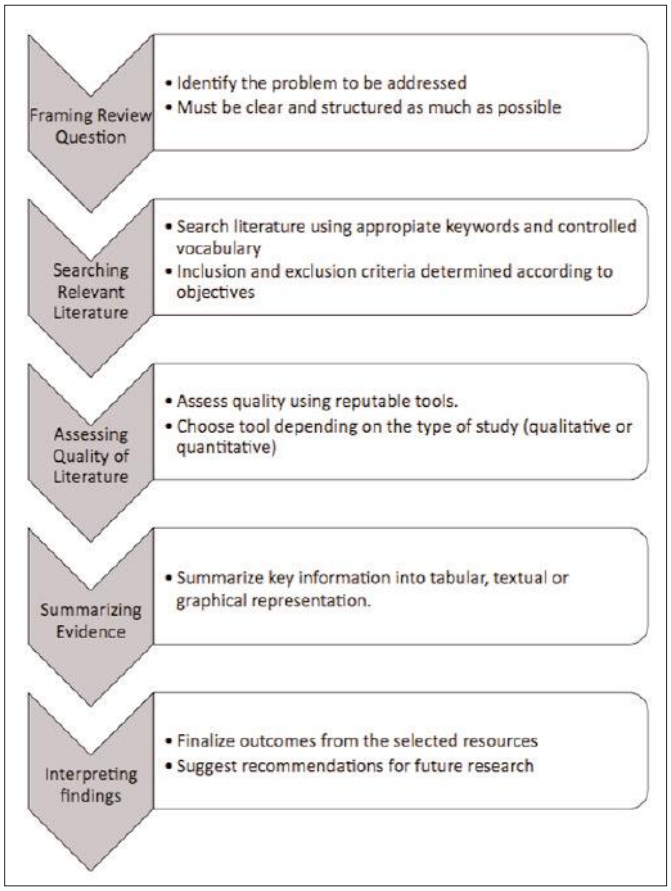

Figure 1: Steps of conducting a review.

These steps can be customized according to the type of review. Appropriate tools have been designed for summarizing quantitative and qualitative studies.[14] In order to develop a well-formulated question, it is beneficial to apply systematic approach. There are a number of frameworks available for doing this, of which PICOS and SPIDER are very useful when framing health research questions.[13] PICOS is a well-recognized framework (Box 1) designed for reviewing quantitative studies, whereas SPIDER is used predominantly for qualitative studies (Box 2).[14]

Various tools are available for assessing the quality of studies.[15] The Consolidated for Reporting Qualitative Research (COREQ) or the Standards for Reporting Qualitative Research (SRQR) are two tools commonly used to assess qualitative studies.[16,17] For quantitative studies, the Effective Public Health Practice Project (EPHPP) is the most commonly used assessment tool.[18] For ease of evaluating the quality of studies, the equator network provides an extensive list of assessment tools (http://www.equator-network.org/reporting-guidelines/).

Box 1: Elaboration and explanation of PICOS with an example of a systematic review.

Elaboration of PICOS

P: Population

I: Intervention

C: Comparison

O: Outcome

S: Study Design

Example: Donaldson, J. F., Lardas, M., Scrimgeour, D., Stewart, F., MacLennan, S., Lam, T. B., & McClinton, S. (2015). Systematic review and meta-analysis of the clinical effectiveness of shock wave lithotripsy, retrograde intrarenal surgery, and percutaneous nephrolithotomy for lower-pole renal stones. European urology, 67(4), 612-616.

P: Patients with lower pole renal stone.

I: Shock wave lithotripsy (SWL), retrograde intrarenal surgery (RIRS), and percutaneous nephrolithotomy (PNL).

C: Each intervention above is compared with one another.

O: Different realms of effectiveness across various therapies for lower-pole renal stones.

S: Experimental studies including randomized controlled trials (RCTs).

Box 2: Elaboration and explanation of SPIDER with an example of a qualitative systematic review.

Elaboration of SPIDER

S: Sample

PI: Phenomenon of Interest

D: Design

E: Evaluation

R: Research type

Example: Oishi A, Murtagh FE. The challenges of uncertainty and interprofessional collaboration in palliative care for non-cancer patients in the community: A systematic review of views from patients, carers and health-care professionals. Palliative medicine. 2014 Oct 1;28(9):1081-98.

S: Patients with life-limiting diseases other than cancer, carers, any health care providers.

PI: Primary palliative care for non-cancer patients at home.

D: Any design (both quantitative and qualitative or mixed).

E: 'Views' of participants.

R: Qualitative.

Types of reviews: A scoping search was conducted to identify the review typology. Several types of review articles are presented in the literature. For the purpose of this paper, nine common types of reviews have been selected describing their major characteristics inducing strengths, weaknesses, and applications. Suitable examples of these different types of reviews are also provided. Table I shows the key features, strengths and weaknesses of the types of reviews. Table II describes the characteristics of the review types on the basis of the SALSA (Search, Appraisal, Synthesis and Analysis) analytical. Example of each type of review is shown in Table III.

Literature Review: The terminology 'literature review' is a broad term. Medical Subject Heading (MeSH) describes it as a tool that assist in dealing with a specific unanswered research question on a particular topic area. It can cover a broader aspect of topic at different levels of comprehensiveness based on an analysis which may include literature findings.[19] It contains inclusion criteria for selecting appropriate cited resources on a topic, but does not require a formal comprehensive search and systematic synthesis to develop a material in textual, tabular or graphical form.

Scoping Review: To evaluate and assess the potential size and scope of available literature on a particular topic, a scoping review is needed. The purpose of a scoping review is to identify the nature and extent of resources available, including ongoing research. It reveals the undiscovered areas for further research to have a better understanding of the subject.[20]

Critical Review: Whenever researchers aim to conduct extensive research on any topic and wishe to critically evaluate its effectiveness and quality, a critical review is used. This type of review is not only limited to a simple description of identified articles, but rather its main focus is an analysis using appropriate criteria such as strengths, weaknesses or validity of cited resources. It extracts and synthesizes main concepts from diverse cited sources.[21] The resulting product may be a critically elaborated conceptual innovation of an existing model or a completely unique idea on an existing topic, including a new school of thought. After reading such reviews, a reviewer will be able to make judgment about a topic. This will help leading to an evaluation of newly developed concepts, typically resulting in the formation of a hypothesis.[9,22]

Systematic Review: Systematic review is one of the most widely used types of review. This includes a systematic approach for searching, synthesizing and contextualizing existing literature. Systematic review is conducted based on the guidelines provided by the Cochrane Collaboration and the National Health Service (NHS) Centre for Reviews and Dissemination.[23,24] Due to its formal nature, it occupies prime importance in evidence-based health care information, using explicit methods to deal with research questions in order to identify reliable and quality data on a particular topic, thus reducing chances for bias. This type of review is sometimes considered an original article, replicable by any other researcher due to its demanding protocol.[22]

Meta-Analysis: Meta-analysis uses statistical procedure to estimate an amalgamated effect by combining data from multiple different studies on a given association or epidemiological estimate. Meta-analysis helps increase precision by adding more power to the pooled estimate than separate studies reported in their individual estimates. This also helps to examine consistency of effect across different studies.[25] Meta-analysis is used along with a systematic review which ensures that a comprehensive identification of possible studies are done. For a meta-analysis to be deemed valid and of high quality, it is essential to ensure that all literatures have similar parameters,[9] such as population characteristics, interventions used and comparison tools. Most importantly, it should contain a matching outcome. As meta-analysis provides a summary of multiple outcomes from different research, the results derived from this are valuable resource for policy-makers or decision-makers.[26]

Mapping Review/Systematic Map: This review type has been developed by the Evidence for Policy and Practice Information and Coordinating Centre (EPPI-Centre), Institute of Education, London. It aims to map out and classify existing studies on a particular topic.[27] As a scoping review, it also identifies potential gaps, thus creating ideas for further review or suggesting a new topic for research. It differs from scoping review, as the primary outcome is not known beforehand, and subsequent outcomes will lead to further review or primary research on a particular topic.[9]

Qualitative Systematic Review/Qualitative Evidence Synthesis: This review aims to integrate and compare

the outcomes of qualitative studies. The resulting conclusion may lead to further development of a new theory or an interpretative translation. Its goal is not to aggregate studies such as done with a meta-analysis; rather, it aims to integrate the findings into a broader category.[28,29]

Meta-Synthesis: Noblit and Hare in 1988 defined meta-synthesis as a byproduct of a methodology used for meta-ethnography.[30] It includes a rigorous systematic methodology that includes multiple qualitative studies that evaluate, interpret and transform these study findings to synthesize new conceptualizations and interpretations that could be used for EBM.[31] It does require studies to be similar in their criterion and phenomenon. A good meta-synthesis should provide clear descriptions about each step of its methodology to be effective for EBM.[32] While a meta-analysis of qualitative data aims to determine the effect

Table I: Key features, strengths and weaknesses of nine common types of reviews.

Type of Review	Key Features	Strengths	Weaknesses
Literature Review/Narrative Review/Overview	• Evaluate the current literature on a particular topic • Need specific inclusion criteria for selecting studies	• Consolidate previously-known knowledge • Avoid duplication by identifying previous work • Highlight gaps in studies for future evaluation	• Does not place emphasis on analyzing collected data • Does not require a formal systematic search, thus generating the possibility of bias, by omitting or limiting a search
Scoping Review	•Evaluate potential scope of literature available on a particular topic •Identify extent of resources available including ongoing research	• Identify need for full systematic review • Identify gaps in literature for future research • Update researchers, policymakers about extent of work already done	• Has a quality bias, as review is based on existence of literature, not on formal quality assessment • Final output cannot be used to suggest or recommend policy or practice
Critical Review	• Critically evaluate effectiveness and quality of cited resources • Reader can make judgement about topic of interest	• Extract information critically • Quick and elaborated overview • Often involves competing schools of thought	• Lack of systematic search • Not formal quality assessment • May create bias in formulating outcome of review which is subjective and leads to further new concepts to evaluate
Systematic Review	• Includes systematic approach for searching literature following a standard scientific protocol • Prime importance in evidence-based medicine • Identify reliable and quality data	• Gather and assess quality of all the scientific knowledge on a particular topic • Reduces bias because of its systematic nature	• Being a subjective review, it does have selection bias
Meta-Analysis	• Develop precise statistical outcome of multiple quantitative studies • Reader can get idea about population characteristics and results • Requires all included studies to have sufficiently similar measures	• Valuable resources for policy makers or decision makers as it assimilates multiple outcomes • Overcomes the issue of small sample size of individual studies • Increases precision of estimating effects • A comprehensive analysis would provide an idea of a need for future research on an issue	• Inappropriately including studies that are not similar affects the findings of analysis
Mapping Review	• Map out and classify existing literature on a topic • Differs from scoping review, as outcome is not known before hand and the findings of these reviews will open doors to further analysis	• Enables contextualization of detailed literature • Important for policymakers or decision makers to deal with practice-relevant review questions • Also determines population characteristics; helpful in synthesizing review on a particular subset	• Time constrained and lacks systematic approach • May oversimplify or mask the significant outcome • No quality assessment of cited resources
Qualitative Systematic Review	• Integrate and compare outcome of qualitative studies • Interpret the findings in a broader aspect on a particular subject	• Used to assess barriers and facilitators for any service uptake • Compliments research evidence in light of user-reported and practitioner- observed considerations • Being generalized in nature, increases its worth compared to local surveys	• No specific methodology
Meta-Synthesis	• Describe, interpret and transform data from multiple qualitative studies • Aims to determine the explanation for particular phenomena as opposed to meta-analysis that focuses on quantitative outcomes	• Valuable resource in the era of EBM • Involves a rigorous and systematic approach • Identifies common core elements and themes • Non-statistical technique	• Including irrelevant studies will decrease the effectiveness of the review • Studies without clear description of each step of review will not be quickly adopted for EBM
Realist Review	• Deals with finding outcomes related to complex interventions • Aims to seek explanatory focus	• Includes relevant studies because of its systematic methodology • Explains the outcomes of findings rather than judging results	• Uses argumentation analysis to deal with identifying context and mechanism of the study • Complicated and time- consuming for reviewers
Review of Reviews/ Umbrella Reviews	• Extracting outcomes from multiple reviews	• Easier for reviewer to go through single review • Helpful for decision makers	Requires pre-existence of the narrowest component of reviews

Table II: Major types of reviews described using the search, appraisal, synthesis and analysis (SALSA) framework.

Type of review	Methods Used by SALSA			
	Search	**Appraisal**	**Synthesis**	**Analysis**
Literature Review/Narrative Review/Overview	• May or may not include comprehensive searching	• May or may not include quality assessment	• Typically, narrative	• Analysis may be chronological, conceptual, thematic, etc.
Scoping Review	• Completeness of searching determined by time/scope constraints. May include research in progress	• No formal quality assessment	• Typically, tabular with some narrative commentary	• Characterizes quantity and quality of literature, perhaps by study design and other key features. Attempts to specify a viable review
Critical Review	• Seeks to identify most significant items in the field	• No formal quality assessment. • Attempts to evaluate according to contribution	• Typically, narrative, perhaps conceptual or chronological	• Significant component: seeks to identify conceptual contribution to embody existing or derive new theory
Systematic Review	• Aims for exhaustive, comprehensive searching	• Quality assessment may determine inclusion/exclusion	•Typically, narrative with tabular accompaniment	• What is known; recommendations for practice. What remains unknown; uncertainty around findings, recommendations for future research
Meta-Analysis	• Aims for exhaustive, comprehensive searching. • May use funnel plot to assess completeness	• Quality assessment may determine inclusion / exclusion and/or sensitivity analyses	• Graphical and tabular with narrative commentary	• Numerical analysis of measures of effect assuming absence of heterogeneity
Mapping Review	• Completeness of searching determined by time/scope constraints	• No formal quality assessment	• May be graphical and tabular	• Characterizes quantity and quality of literature, perhaps by study design and other key features. May identify need for primary or secondary research
Qualitative Systematic Review	• May employ selective or purposive sampling	• Quality assessment typically used to mediate messages not for inclusion/exclusion	•Qualitative, narrative synthesis	• Thematic analysis, may include conceptual models
Meta-synthesis*	• Aims for rigorous, systematic search of relevant studies	• Quality assessment may determine inclusion/exclusion and/or relevance	• May involve narrative commentary with tabular and graphical representation	• Interpret and transform findings from multiple qualitative studies to reflect the explanation of the phenomena
Realist Review	• Formal Systematic search	• Assessment of relevance and rigor	• Typically, tubular with some narrative commentary	• Identify the attributes of 'what works, how, for whom, in what circumstances and to what extent' for any intervention
Review of Reviews/ Umbrella Reviews	• Identification of component reviews, but not primary studies	• Quality assessment of studies within component reviews	• Graphical and tubular with some narrative commentary	• What is known recommendation for practice • What remain unknown; recommendation for future research

*Adopted from: The details of The Search, Appraisal, Synthesis and Analysis (SALSA) framework presented with permission from John Wiley and Sons from the following reference: Grant MJ, Booth A. A typology of reviews: an analysis of 14 review types and associated methodologies. Health Information & Libraries Journal. 2009;26(2):91-108.*The type (Meta Synthesis), which was not included in the Grant et al article, has been included by the authors of this manuscript.*

of numerical findings with mathematical precision, a meta-synthesis aims for determining, describing, interpreting and transforming data that explain a particular phenomenon.[33]

Realist Review: A realist review deals with complex interventions, their outcomes, study settings and designs.[34] It aims to seek an explanatory focus, through a theory-driven, qualitative mixed-method approach towards a systematic review. A realist review discovers and identifies the reasons for thriving or failing of a complex intervention in a particular setting, thus helping in the development and understanding of a particularly complex social intervention.[22]

Review of Reviews/Umbrella Reviews: When compiling and extracting outcomes from multiple reviews, a review of reviews is needed. In literature, many topics have multiple systematic reviews with varying degrees of quality and scope. Thus, a review of reviews is needed to finalize into a single document where the results of multiple reviews can be compared, thus making it easier for the decision-maker.[35]

DISCUSSION

The objective of this manuscript is to provide a basic introduction to the reviews, types and their utilization for purpose of synthesizing evidence. Different basic types of reviews commonly seen in health literature are also described and some general considerations including their strengths and limitations are highlighted. It aims to provide the *novice* researcher the basic understanding about the fundamental types of reviews and their applications in knowledge synthesis. The approaches that are necessary to typify the reviews rely on the terminology used by the authors themselves, focusing on inputs, especially on the time taken, and the requirements necessary to complete this tangible process.[9] Considering only terminology, while searching databases, is not quite a reliable method as there are terms that can be used with different meanings. With regards to the time taken to complete a review, a toolkit had been formed by the Government Social Research's Rapid Assessment (REA).[36] But again, this is not entirely a suitable approach as time taken could be affected by

Table III: Examples of each type of review with their corresponding reference and objectives.

Type of review	PMID	Author	Title	Objective of the study
Literature Review	26957335	Azad MC *et al.*	Cardiovascular diseases among patients with schizophrenia.	This review summarizes the extent of cardiovascular problems, relevant risk factors and measures for earlier diagnosis, preventing such problems among patients with schizophrenia. It also highlights the need for further assessment of the genetic association between these problems and schizophrenia.
Scoping Review	26768130	Shommu NS *et al.*	What is the scope of improving immigrant and ethnic minority healthcare using community navigators: A systematic scoping review.	This article reviewed literature systematically and summarizes the role of community navigators, who helped immigrant and ethnic minority groups in Canada and the United States overcome barriers to healthcare. It also recommends the need for further research that focuses specifically upon immigrant populations.
Critical Review	21678634	Balshem H *et al.*	A critical review of the literature regarding homelessness among veterans.	This review aims to identify what is known and what is not about the prevalence of homelessness among Veterans. It also reflects on the risk factors for homelessness among Veterans, including those related to military service and incarceration.
Systematic Review	26436568	Thomas RE *et al.*	Interventions at the laboratory level to reduce laboratory test ordering by family physicians: Systematic review.	This review article assesses the effectiveness of interventions by laboratories to increase rational and reduce unnecessary ordering of tests by family physicians.
Meta-Analysis	28051791	Fabrizi F *et al.*	Association between hepatitis B virus and chronic kidney disease: a systematic review and meta-analysis.	The study aims to evaluate the effect of Hepatitis B Virus infection on the risk of chronic kidney disease in the general population.
Mapping Review	22021730	Brett J. *et al.*	A systematic mapping review of effective interventions for communicating with, supporting and providing information to parents of preterm infants.	This review article maps out effective interventions for communication with pre-term infants, while also supporting and providing information for parents.
Qualitative Systematic Review	28031028	Overbeck G *et al.*	Enablers and barriers to implementing collaborative care for anxiety and depression: a systematic qualitative review.	This review focuses on the collaborative care that has shown significant positive effects for patients suffering from depression. However, since collaborative care is a complex intervention, it is important to understand the factors which affect its implementation. The paper presents a qualitative systematic review of the enablers and barriers to implementing collaborative care for patients with anxiety and depression.
Meta-Synthesis	28073051	Crowe M *et al.*	Older peoples' strategies for coping with chronic non-malignant pain: A qualitative meta-synthesis.	This study examines how older people cope with non-malignant chronic pain and synthesis the themes reported in qualitative studies that examined how people 65 years+ adopt coping skills for such pain control.
Realist Review	27375128	Lodenstein E *et al.*	Health provider responsiveness to social accountability initiatives in low- and middle-income countries: a realist review.	This article uses a realist approach to review cases of collective citizen action and advocacy in low- and medium- income countries with an aim of identifying key mechanisms of health provider responsiveness.
Review of reviews	23974545	Luna D *et al.*	Health Informatics in Developing Countries: Systematic Review of Reviews. Contribution of the IMIA Working Group Health Informatics for Development.	The aim of this paper is to identify systematic reviews on the domain of health informatics in developing countries, and classify the different types of applications covered.

various factors such as availability of resources, the quality of resources, the search strategies utilized, or the expertise of the researchers. Another approach, as described in Table II, is based on the search, appraisal, synthesis and analysis framework. This SALSA framework depends neither on terminology nor on inputs, rather this framework is congruent with the principles of evidence-based medicine.[9]

Considering these common review types and methodologies, it may provide a pragmatic 'shorthand' for authors who face difficulty in overlapping terms in describing different review types. Using four main processes associated with the SALSA framework, authors may identify and categorize a review according to one of the identified types. Using this approach will clearly demarcate the distinguishing features of each type within the broader systematic review or literature review category.

CONCLUSION

With continuous advancements in medical practice and research, reviews play a significant role. Identifying and characterizing a review is essential to present a particular topic of interest. Selecting an appropriate type of review is not only helpful for readers, but also contributes to an evidence-based health care system by generating a clear understanding about a topic.

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