

# Critical Appraisal Tools for Qualitative Systematic Reviews in Medical Education

Muhammad Saaq<sup>1</sup>, Bushra Ashraf<sup>2</sup>

<sup>1</sup> FCPS (Plastic Surgery), FCPS (Surgery), MHPE (Medical Education), MBBS (Khyber).

Consultant Plastic and Reconstructive surgeon, National Institute of Rehabilitation Medicine (NIRM), Islamabad, Pakistan

<sup>2</sup> M.S (Obs. & Gynae.), CHPE (Medical Education), MBBS (Baqai)

Federal Government Polyclinic Hospital, Islamabad, Pakistan

## Abstract

### Background

The Problem and Gap: Critical appraisal of qualitative systematic reviews continues to be an underdeveloped field in medical education. There is great confusion regarding the choice of the most suitable tool for appraising such reviews.

The Hook: In-depth understanding of the existing critical appraisal tools (CATs) is expected to help the development of a new and more comprehensive tool that would better guide the process of qualitative systematic reviews appraisal.

### Methods

A systematic search strategy was employed and a meticulous literature search was undertaken. The following search engines were used: PubMed, Google Scholar and ERIC. A thematic analysis of the finally included articles was performed to determine common themes and subthemes about critical appraisal of qualitative systematic reviews. The available CATs were critically assessed.

### Results

The common themes identified included quality of the study, its design, standards of reporting, rigor of the review and trustworthiness. An extended new tool was developed in an attempt to address the needs of a robust qualitative review, keeping in mind the essential standards of scientific rigor, trustworthiness and completeness of the evidence.

### Conclusion

The new tool that resulted from the current research includes a comprehensive range of criteria necessary for thoroughly reviewing qualitative systematic reviews. The tool will help future researchers to achieve their objective of appraising the reviews in a more thorough and structured fashion.

### Keywords

Qualitative systematic reviews; Qualitative research; Critical appraisal; Critical appraisal tools.

Received: 2023-12-10 Accepted: 2024-03-13

Published Online: April 2024

## Introduction

A qualitative review attempts to systematically synthesize findings from all the relevant primary qualitative studies of a given topic. The most common types of such reviews include qualitative systematic review, scoping review, realist review and narrative review [1]. The primary qualitative studies entail systematically collected textual data or scripts which are derived from conversation, observation or documentation. These primary research pursuits focus on complex phenomena such as behaviors, experiences, values, meanings and interactions of individuals or groups in their natural contexts [1-3].

Critical appraisal (CA) of a qualitative systematic review is both an art and science. It involves systematic evaluation of the review for its scientific rigor,

### How to cite this article

Saaq, M.& Ashraf, B. "Critical Appraisal Tools for Qualitative Systematic Reviews in Medical Education" J Health Prof Edu Innov, Vol. 1, no. 2, April 2024, pp 38-46.

Doi: 10.21608/JHPEI.2024.254400.1009

### Correspondence Address

Dr Muhammad Saaq,  
Consultant Plastic surgeon and Medical educationist,  
National Institute of Rehabilitation Medicine (NIRM), Street  
No.9, G-8/2, Islamabad,  
Email muhammadsaaq5@gmail.com , +923355411583  
(ORCID Id 0000-0003-1714-0491)



trustworthiness, value, relevance, flawlessness and completeness of the generated evidence. This process is crucial to ensure authenticity of the review before it can be used to guide evidence based-practices and policies [4-7].

The critical appraisal of qualitative systematic reviews is a cognitive exercise of a higher order. It is performed in a systematic and thorough fashion. The researcher first develops a good understanding of the research question or objective of the qualitative review. She or he then ensures that the review has followed a standard protocol, adequately defined the research question, outlined the relevant inclusion/exclusion criteria, and narrated the methods employed for data collection and analysis. A comprehensive and transparent search strategy should have been adopted with search of a range of relevant databases and resources. The quality and rigor of the included studies should have been ensured by using some established tools for quality assessment of the primary research pursuits [1,4,5]. It should also be ensured that the review has followed standard reporting guidelines, such as the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) for systematic reviews [8]. By systematically following the aforementioned steps, one can critically appraise a qualitative systematic review and hence determine its reliability, validity, and relevance.

This study was undertaken to identify the available critical appraisal tools (CATs) for qualitative systematic reviews in medical education, identify the common themes and subthemes and develop a more thorough critical and well-structured appraisal tool for critically appraising such qualitative systematic reviews.

## Methods

### Search strategy

A methodological and systematic search strategy was employed to find answer(s) to the following research question: What are the criteria of appraisal tools needed for critically appraising qualitative systematic reviews? The key terms were defined and relevant databases were searched to find out the relevant literature. The search

engines included PubMed, Google Scholar, ERIC; and manual search for relevant articles was also undertaken.

### Key terms used

Maximum possible key terms were employed for the literature search. In order to ensure the complete covering and exhaustion of the topic, the following search strings were employed for the PubMed: (critical appraisal tool\* OR critical appraisal checklist\* OR critical appraisal framework\* OR critical appraisal questionnaire\*) AND (qualitative systematic review\* OR scoping review\* OR realist review\* OR narrative review\*) AND (medical education).

### Review period

The literature review period was Jan 01, 1990 to Dec 31, 2022.

### Inclusion criteria

All publications relevant to the research question, published between 1990 and 2022 were included. These were:

- Full text articles, systematic reviews and meta-analyses, relating to critical appraisal of qualitative systematic reviews.
- AMEE (Association for Medical Education in Europe) guides were followed.
- Guidelines/ frameworks published by international societies and organizations.
- English language literature only were included.

### Exclusion criteria

The following publications/ literature were excluded:

- Abstracts only.
- Conference proceedings.
- Citations only.
- Thesis and dissertations.
- Non relevant data.

### Studies selected

Relevant articles were selected through the phases of identification, screening, eligibility determination and final inclusion in the synthesis. (Figure-1)

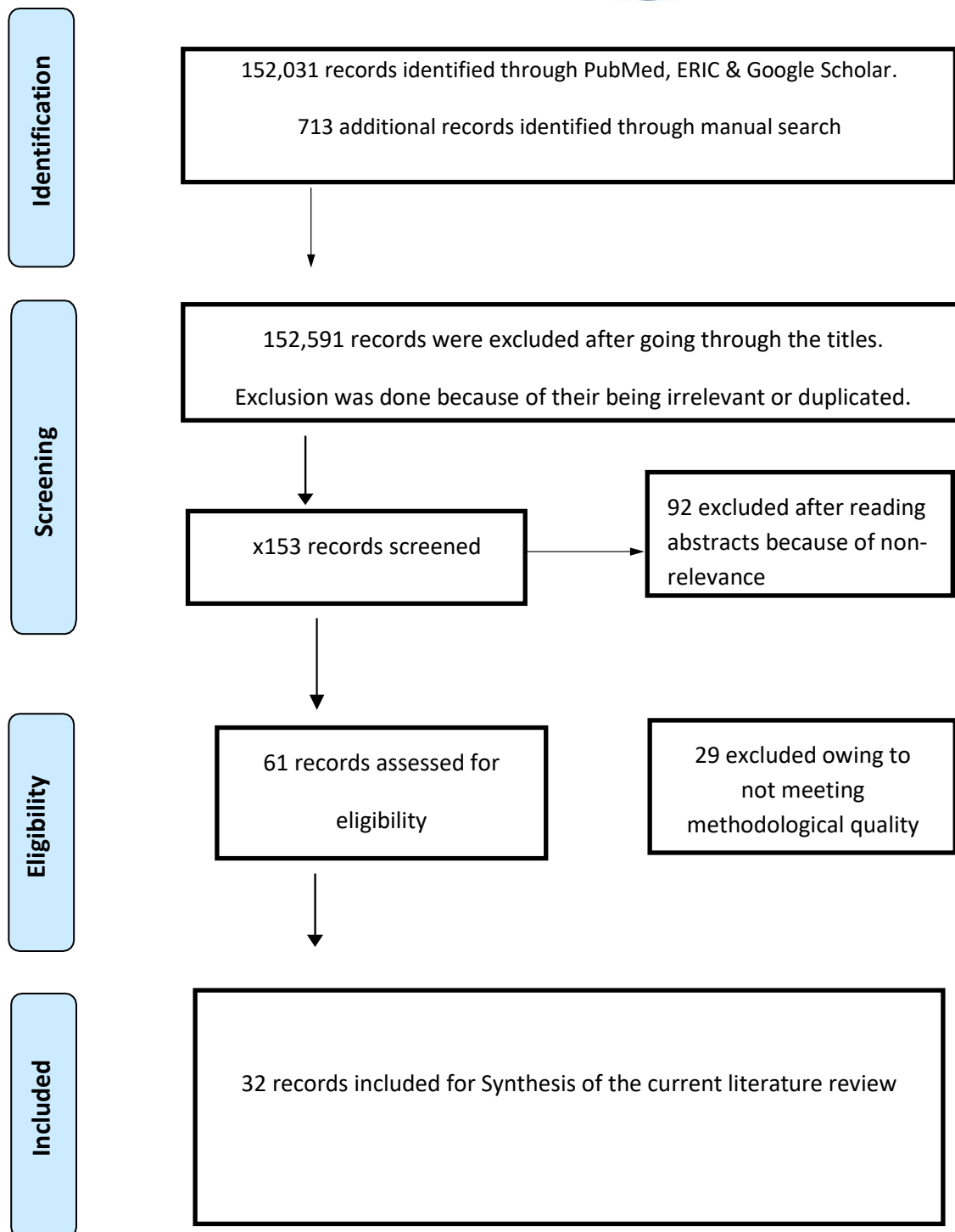


Fig. 1: PRISMA Flow Chart: Search results based on PRISMA categorization.



## Data analysis

A thematic analysis of the included articles was performed to determine common themes and subthemes about critical appraisal of qualitative systematic reviews. The thematic analysis involved two researchers. They had iterative rounds of thorough discussions regarding the themes and subthemes that emerged from the data. In case a disagreement arose during the process of theme extraction, it was reconciled through an open dialogue to reach a consensus on the interpretation of the data.

## Results

The following critical appraisal tools were widely reported in the published literature [8-18]:

The PRISMA statement: It was originally devised to serve as a guiding framework for systematic reviewers and was updated in 2020. The 27-items checklist helps to guide transparent reporting of the review [8].

Assessment of Multiple Systematic Reviews-II (AMSTAR-II). The AMSTAR-II is a major revision of the original AMSTAR instrument, which was designed to appraise systematic reviews. It has a total of 16-items checklist [11].

The Joanna Briggs Institute (JBI) checklist: This tool has been devised by the Joanna Briggs Institute at the University of Adelaide, South Australia. It includes ten critical appraisal questions with a predominant focus on the methodological rigor and quality of the research [12].

Consolidated criteria for reporting qualitative research (COREQ): This tool consists of 32-items. The tool was devised primarily to structure the reporting of in-depth interviews and focus groups. Table 1 comprehensively enlists some of the common Critical appraisal tools (CATs) identified for reviewing qualitative systematic reviews [15].

Table 1: Frequently employed CATs for the critical appraisal of qualitative systematic reviews.

	Tools, Frameworks & Questionnaires	Strengths	Weaknesses
1	PRISMA (Preferred Reporting Items for Systematic reviews and Meta-Analyses) [8].	This tool provides a comprehensive framework for the reporting of systematic reviews and meta-analyses.	<ul style="list-style-type: none"> <li>• Its main focus is on the quality of reporting of the review.</li> </ul>
2	PRISMA-ScR checklist (PRISMA extension for Scoping reviews) [9].	<p>It is an extension of the original PRISMA statement and contains 20 essential reporting items and two optional items.</p> <ul style="list-style-type: none"> <li>• The checklist is aimed to provide information specific to scoping review, thus improving their quality of conduct and reporting. It also ensures transparency.</li> </ul>	<ul style="list-style-type: none"> <li>• It is specifically suited for scoping reviews.</li> </ul>
3	Assessment of Multiple Systematic Reviews-II (AMSTAR-II) Checklist [10, 11].	<p>This tool includes 16 criteria which cover most of the essential themes of the critical appraisal.</p> <ul style="list-style-type: none"> <li>• The tool particularly ensures methodological rigor.</li> <li>• It is well-validated.</li> </ul>	<ul style="list-style-type: none"> <li>• Criteria for assessing trustworthiness of the reviews are largely missing.</li> <li>• Several questions can be modified to make them more aligned with an assessment of the methodological quality of the reviews.</li> <li>• More questions can be included to provide for subgroup and sensitivity analyses.</li> <li>• More detailed instructions should be incorporated for scoring various individual items.</li> </ul>



4	<p>JB I (Joanna Briggs Institute) critical appraisal checklist for qualitative research [12].</p>	<p>This tool entails 10 critical appraisal questions to be answered with a yes or no. The questions are followed by an overall appraisal decision.</p> <ul style="list-style-type: none"> <li>• The checklist allows for better assessment of the study details compared to other available tools. It includes philosophy of the study and researcher &amp; its congruity with the methodology. It also includes reflexivity.</li> <li>• The questions and explanations are clearly written in easy language making it user friendly.</li> <li>• Owing to its brevity and clarity even novice consumers can easily employ it.</li> <li>• The JB I also provides an online software called Qualitative Assessment and Review Instrument (QARI) that facilitates the online use of the tool.</li> </ul>	<ul style="list-style-type: none"> <li>• The main emphasis of the JB I tool is on alignment between philosophy, methodology and methods.</li> <li>• Rigor and trustworthiness are not fully covered in the checklist.</li> </ul>
5	<p>Critical Appraisal Skills Programme (CASP) qualitative research checklist 2020 [13].</p>	<p>The CASP tool contains specific questions and some open-ended questions. The tool is generic for appraising the strengths and weaknesses of any qualitative research.</p> <ul style="list-style-type: none"> <li>• It is one of the most commonly employed tools as it is user-friendly for qualitative researchers. It is also a useful educational tool for learners.</li> <li>• It is validated by many studies and is endorsed by Cochrane collaboration as well as the World Health Organization (WHO) for use in qualitative evidence synthesis.</li> </ul>	<p>Although the CASP tool is a relatively good measure of transparency of research and its reporting, however it is weaker on the following counts:</p> <ul style="list-style-type: none"> <li>• Research design and conduct.</li> <li>• Weaker in evaluation of the methodological quality compared to other appraisal tools.</li> <li>• Adaptations of the tool are time consuming.</li> <li>• It favors studies with better methodological quality; however may make weaker contributions to the field.</li> </ul>
6	<p>ETQS (Evaluation tool for qualitative studies) [14].</p>	<p>This tool contains 38 questions. The ETQS provides detailed instructions on how to interpret criteria.</p> <ul style="list-style-type: none"> <li>• It is comprehensive.</li> <li>• The evaluative abstract serves as a summary of the study.</li> </ul>	<ul style="list-style-type: none"> <li>• Lack of emphasis on philosophy and its congruity with methodology and methods.</li> <li>• It requires qualitative expert use.</li> <li>• It is more time-consuming than other appraisal tools.</li> </ul>
7	<p>COREQ (Consolidated criteria for reporting qualitative research) [15].</p>	<p>This tool has 32 structured statements.</p> <ul style="list-style-type: none"> <li>• The tool is widely used and endorsed by many international journals.</li> <li>• It is developed through a systematic search and review of previously developed appraisal tools.</li> </ul>	<ul style="list-style-type: none"> <li>• There is lack of emphasis on influence of philosophy on qualitative inquiry.</li> <li>• It is only applicable to studies that employ focus groups and interviews as their data collection methods.</li> <li>• It lacks guidelines to evaluate studies that use non-traditional data collection methods, or a combination of traditional and non-traditional methods.</li> </ul>



8	Risk of bias in systematic reviews (ROBIS) tool [16].	It is the first rigorously developed tool designed specifically to assess the risk of bias in systematic reviews. <ul style="list-style-type: none"> <li>• It helps to improve the process of risk of bias assessment in overviews and guidelines, leading to more robust recommendations for improvements in patient care.</li> <li>• It is less time consuming.</li> </ul>	<ul style="list-style-type: none"> <li>• The tool does not focus on the methodological quality.</li> <li>• To be able to apply this tool, a reasonable level of subject mastery is mandatory.</li> </ul>
9	RAMEES (Realist and Meta-narrative Evidence Syntheses Evolving standards [17].	This tool provides an exhaustive list of publication standards for realist reviews. It is aimed to ensure consistency and rigor of reporting of the realist reviews.	<ul style="list-style-type: none"> <li>• It provides publication standards which are specific for realist reviews.</li> <li>• Being relatively newer tool, it is neither widely validated nor compared to other available tools.</li> </ul>
10	Oxford Systematic review critical appraisal sheet [18].	It includes five basic questions regarding the review under scrutiny. <ul style="list-style-type: none"> <li>• It is written in a clear concise manner, thus allowing the reader to evaluate the review methodically to determine its quality.</li> </ul>	<ul style="list-style-type: none"> <li>• It does not go into the details of rigor and trustworthiness.</li> </ul>

The following five major themes were covered by the published literature: 1) research design, and theoretical underpinning; 2) quality of the study: 3) quality or standards of the reporting: 4) rigor of the research: and

5) trustworthiness of the research. Table 2 summarizes the common themes and subthemes taken from the available CATs.

Table 2: The common themes and subthemes identified from the CATs.

	Themes	Subthemes
1	Research design/ Objectives and theoretical underpinning	Qualitative research design Theoretical perspective Ethical consideration End user involvement in study
2	Quality of the study	SPIDER question Thick description and context
3	Quality/ standards of reporting	PRISMA/ PRISMA-ScR flow diagram Data acquisition, analysis and interpretation Representativeness
4	Rigor	Methodological rigor Evaluative rigor Interpretative rigor
5	Trustworthiness	Credibility Dependability Confirmability Transferability or relevance: Reflexivity





Table 3 represents the synthesized new tool for reviewing qualitative systematic reviews. The tool consists of a 39-items list that covers the following seven questions regarding various aspects of the review: 1) Does the review show methodological rigor? 2) Does the review highlight the review team? 3) Does the review reflect true representativeness? 4) Does the review show quality of the included articles? 5) Does

the review show evaluative rigor? 6) Does the review show interpretative rigor? 7) Does the review show trustworthiness? By awarding one point to each of the 39-items, a total score of 39 will be obtained by the most robust review [19-27]. This provides a quantitative figure that represents 39 qualitative points that were structurally and critically addressed, albeit in a qualitative way.

Table 3: The recommended new tool for critically appraising qualitative systematic reviews.

	Evaluation criteria	Criteria met		
		Yes	No	Score
A	Does the review show methodological rigor? 1. Is a priori review protocol mentioned by the authors? 2. Is PROSPERO registration of the review ensured? (i.e., the authors published the protocol before undertaking the review and hence enhance the transparency and trustworthiness of the findings). 3. Is explicit or transparent description of the research protocol provided by the authors? 4. Is qualitative study design mentioned? 5. Is the sampling strategy briefly elaborated? 6. Are the data collection techniques or methods clearly documented? 7. Are standardized data extraction forms mentioned? 8. Is the data analysis transparent and systematic? 9. Is the Risk of Bias Assessment provided? 10. Were robust and reproducible search strategies employed? 11. Are Key Words and Search strings mentioned? 12. Are Search engines and Databases mentioned? 13. Are the Boolean operators or limits employed in the search are provided? 14. Are the number of articles retrieved mentioned? 15. Is PRISMA flow diagram provided?			
B	Does the review highlight the Review team? 16. Is assembling of the review team mentioned? 17. Are roles of the members described? 18. Are appropriate contact details of the corresponding author provided for any further information?			
C	Does the review reflect true Representativeness? 19. Does the review include all relevant important studies? 20. Are the inclusion criteria clearly mentioned? 21. Are the exclusion criteria clearly outlined? 22. Do the sampling techniques support the conceptual generalizability?			
D	Does the review show Quality of the included articles? 23. Did the authors ensure quality of the included articles? 24. How did they include and exclude articles? 25. Are deviant articles or studies highlighted in the review?			
E	Does the review show Evaluative rigor? 26. Was ethical approval of the review ensured?			
F	Does the review show Interpretative rigor? 27. Is there researcher triangulation? 28. Is there member check (i.e., respondent validation)? 29. Is there data triangulation? 30. Is there methods triangulation? 31. Is there theoretical triangulation? 32. Has a more conceptual discussion of the results and linkage to the existing theory or new theory been developed to explain the relevance of findings to a targeted audience or discipline? 33. Are the results applicable? 34. Are the results generalizable?			



G	Does the review show Trustworthiness? 35. Credibility 36. Dependability 37. Confirmability 38. Transferability or relevance: <ul style="list-style-type: none"> <li>• Has a critical evaluation of the application of findings to other similar contexts been made?</li> <li>• Has the relevance of these findings to current knowledge, policy, and practice or to current research been discussed?</li> </ul> 39. Reflexivity			
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**Discussion**

The study identified more than 100 critical appraisal tools for assessing the quality of primary qualitative research studies in medical education. In contrast to this, there was relative scarcity of such tools for critically appraising the qualitative systematic reviews [3, 28-30]. Only a handful of CATs (in the form of checklists, grids, questionnaires and frameworks) were available to constitute the armamentarium for critically appraising the qualitative systematic reviews. None of these was an all-encompassing one with respect to coverage of the entire spectrum of the essential criteria required for the critical appraisal process. Some of these tools have tried to fully cover the methodological aspects of the systematic reviews, whereas others have focused on the perfection of the reporting standards or the theoretical underpinnings of their research. Majority of them covered some aspects of trustworthiness. Hence, they all represented partial checklists or criteria for evaluation. Most of the available CATs did not fully cater for the risk of bias in qualitative systematic reviews, ethical considerations, funding issues, and implications for evidence based-practices and policies [29-32].

The common themes identified among the available CATs included quality of the study and its design, quality or standards of reporting, rigor of the review and trustworthiness.

Critical appraisal of qualitative systematic reviews has been an underdeveloped field in medical education. The available plethora of widely differing checklists and frameworks reflected a lack of consensus among the educational researchers. Owing to the confusion and chaos, the novice user is especially faced with a dilemma regarding the choice of most suitable instrument for undertaking critical appraisal of reviews. This new tool has been developed in an attempt to address the aforementioned shortfalls. Its use will ensure that the systematic review meets the basic standards of scientific rigor, trustworthiness, flawlessness and completeness of the evidence; in addition to a numeric quantitative single figure summary for the qualitative appraisal. With increasing use and further development, more improvement and fine tuning in the tool will be incorporated.

In the new tool, the authors have attempted to comprehensively include all essential critical appraisal criteria for qualitative systematic reviews in medical education, while avoiding duplications or repetitiveness. It provides a well-designed and robust checklist that will ensure trustworthiness of the reviews, value of each part

of the review, clarity and relevance of the results and hence their usefulness in evidence based-practices in medical education.

**Recommendations and future directions**

Considering the rapidly expanding body of primary qualitative research as well as qualitative systematic reviews in medical education, the science of critical appraisal of the qualitative systematic reviews is lagging far behind. There is a need to develop it as a distinct discipline of Best Evidence in Medical Education (BEME) with dedicated research infrastructure and incentives. This will ensure better translation and authentication of the reviews. There is also a need to develop Medical Subject Headings (MeSH terms) for this neglected discipline as most of the related key terms are currently not included in the MeSH list of the PubMed/MEDLINE.

**Limitations of the study**

The search of literature was limited to English language only. Significant and relevant articles published in other languages might have been missed. In Table 1, only the most commonly used CATs have been enlisted, as describing all the available CATs is beyond the scope of this review article.

**Conclusion**

The new tool that resulted from the current research includes a comprehensive range of criteria necessary for thoroughly reviewing qualitative systematic reviews. The tool will help future researchers to achieve their objective of review in a more thorough and structured fashion. As the process of critically appraising a qualitative review is much more extensive than reviewing a primary qualitative report; the developed tool shall be further refined where deemed necessary.

**Author's contributions**

MS designed and wrote the manuscript. He performed critical analysis and approved the manuscript.

**Conflict of interest statement**

None declared. The authors have no financial and personal relationships with any organization that could create a conflict of interest with any material presented in the manuscript.





### Financial support/ funding

None declared. There has been no funding or financial support involved in this study.

### Availability of data and material

No.

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