REVIEW

Biomedical and public health reviews and meta-analyses in Ethiopia had poor methodological quality: overview of evidence from 1970 to 2018

Tesfa Dejenie Habtewold[a,b,*], Sisay Mulugeta Alemu[c], Shimels Hussien Mohammed[d], Aklilu Endalamaw[e], Mohammed Akibu Mohammed[f], Andreas A. Teferra[g], Abera Kenay Tura[h,i], Nigus Gebremedhin Asefa[b], Balewgizie Sileshi Tegegne[b]

[a]*Department of Nursing, College of Health Science, Debre Berhan University, Debre Berhan, Ethiopia*
[b]*Department of Epidemiology, University Medical Centre Groningen, University of Groningen, Groningen, the Netherlands*
[c]*Department of Clinical and Psychosocial Epidemiology, University Medical Centre Groningen, University of Groningen, Groningen, the Netherlands*
[d]*Department of Community Nutrition, School of Nutritional Sciences and Dietetics, Tehran University of Medical Sciences-International Campus (TUMS-IC), Tehran, the Islamic Republic of Iran*
[e]*Department of Pediatrics and Child Health Nursing, School of Nursing, College of Medicine and Health Sciences, University of Gondar, Gondar, Ethiopia*
[f]*Department of Midwifery, College of Health Sciences, Debre Berhan University, Debre Berhan, Ethiopia*
[g]*Division of Epidemiology, College of Public Health, The Ohio State University, Columbus, OH, USA*
[h]*Department of Obstetrics and Gynaecology, University Medical Centre Groningen, University of Groningen, Groningen, the Netherlands*
[i]*School of Nursing and Midwifery, College of Health and Medical Sciences, Haramaya University, Harar, Ethiopia*

Accepted 29 January 2019; Published online 2 February 2019

Abstract

Objectives: The aims of this overview are to assess the trend of narrative and systematic reviews in Ethiopia, examine their methodological quality, and suggest future directions for improvement.

Study Design and Setting: All narrative reviews and systematic reviews with or without a meta-analysis on topics associated with Ethiopia irrespective of the place of publication and authors' affiliation were included. The International Narrative Systematic Assessment for narrative reviews and A MeaSurement Tool to Assess Systematic Reviews for systematic reviews with or without a meta-analysis were used for quality appraisal. Fisher's exact test at the *P*-value threshold of 0.05 was used to investigate associated factors of methodological quality.

Results: Of 106 articles reviewed, 54 (50.9%) were narrative reviews, 17 (16%) were systematic reviews, and 35 (33.1%) were systematic reviews with meta-analyses. Among 48 systematic reviews with or without meta-analysis, only five (10.4%) registered their protocol, four (8.3%) justified the selection of the study design for inclusion, and none of them reported sources of funding for the primary studies. Overall, 55.3% of narrative reviews and 75% of systematic reviews with or without meta-analysis had poor methodological quality.

Conclusions: Although publication rate of narrative and systematic reviews has risen in Ethiopia, half of the narrative reviews and three-quarters of the systematic reviews had poor methodological quality. © 2019 Elsevier Inc. All rights reserved.

Keywords: Overview; Umbrella review; Systematic review; Meta-analysis; Public health; Ethiopia

1. Introduction

Health care research aims to advance scientific knowledge, understand the risk factors of ill health, and support improvements in the prevention and treatment of diseases [1]. Carefully designed and implemented research has an enormous impact in the development of any nation; on the other hand, poor-quality research is devastating and could lead to suboptimal health outcomes [2]. Health research is increasing exponentially; for instance, globally in 2016, 869,666 biomedical and public health research citation were indexed in MEDLINE [3]. The increased publication of scientific research has led to the development of new therapies, guidelines, methodological innovations to combine results from primary studies, and remarkable improvements in health care decision-making [4,5].

What is new?

Key findings
- The publication rate of narrative and systematic reviews has risen in Ethiopia.

- Almost half of narrative reviews and three-fourths of systematic reviews with or without meta-analysis had poor scientific methodological quality.

What this adds to what was known?
- To our knowledge, this is the first overview of its kind providing insight into the publication trend of narrative and systematic reviews and their methodological rigor in Ethiopia.

What is the implication and what should change now?
- Our review shows that the methodological quality of reviews in biomedical and public health discipline in Ethiopia is substantially low and urges immediate intervention.

- We recommended authors to strictly follow standardized quality assessment tools during designing, conducting, and reporting (systematic) reviews.

- Moreover, employers, editors, and peer reviewers should carefully evaluate all reviews before submission or publication.

In the hierarchy of evidence, rigorously conducted systematic review and meta-analysis are at the highest rank to correctly inform decision makers [6]. In the last 4 decades, systematic reviews and meta-analyses have been published in biomedical and public health disciplines [7]. In 2014, 8,000 systematic reviews and meta-analyses (22 per day) were indexed in MEDLINE [8]. Whenever a systematic review is impossible, narrative review (also known as historic review or scoping review) can be used to synthesize available evidence, exploring the development of particular ideas and for advancing conceptual frameworks [9]. Currently, 80,000 narrative reviews are being globally published per year [10]. However, both types of aforementioned reviews has a number of methodological challenges including study selection, use of relevant and sufficient databases, and quality assessment [11,12]. To use narrative reviews and systematic reviews with or without meta-analyses for a decision-making, they should be conducted with a high standard of quality and their quality should be continuously appraised [13]. Thus, the Cochrane Collaboration has proposed an overview of reviews (also known as umbrella review), new type of study to compile multiple

evidence from (systematic) reviews into a single document that is accessible and useful [14,15]. The publication rate of overviews has increased globally from 1 in 2000 to 14 in 2010 [16]. Several institutions and methodologists have designed strategies and tools to synthesize and evaluate methodological quality, quality of evidence, and implications for practice despite none being exclusively and universally accepted [15,17]. There is a tremendous disparity in research, given that narrative reviews, systematic reviews, and their quality appraisal tools are mostly published in developed countries [18]. The contribution of researchers from low-income setting, including Ethiopia, to this publication industry is minimal and needs several interventions.

According to 2006 World Health Organization (WHO) survey, Ethiopia is one of the African countries that has health research policy, functional national health research system and Scientific/Ethical Review Committee, health institutions with institutional review committees, national health research institute, and faculty of health sciences at the national universities [19,20]. In Ethiopia, biomedical and public health research is currently conducted by Central Statistics Agency of Ethiopia, Armauer Hansen Research Institute, Ethiopian Public Health Institute, Ethiopian Food, Medicine and Health Care Administration, federal and regional government organizations, academic institutions, private research bodies, nongovernmental and international organizations, individual researchers and professional associations [21]. The research mainly focuses on alleviating major existing health problems including infectious diseases, malaria, diarrhea, acute respiratory infections, tuberculosis, malnutrition, HIV/AIDS, and other sexually transmitted illnesses [21]. Professional associations and private and governmental academic institutions host annual national and international research conferences aiming at transfer of knowledge and skill. In the last decade, the number of primary researches, narrative reviews, and systematic reviews with or without meta-analysis was increased in Ethiopia. For example, 189 and 157 articles have been published in BioMed Central and Public Library of Science international Open Access journals, respectively [22].

Despite the aforementioned efforts, biomedical and public health research in Ethiopia is still at an early stage. Studies are mainly observational, and the number of health researchers and research institutes and the overall volume of research output are small [23,24]. The major challenges are limited budget, brain drain, low attitude, and motivation of professionals (i.e., conducting research only for monetary gain and/or for academic career promotion), low research awareness among the public, lack of communication of research output, and infrastructural problems, such as lack of computers, storage devices, and internet access [22,25]. Cohort-based studies are small and not well organized. Currently, the Butajira birth cohort [26,27], Ethiopian Demographic and Health Survey (EDHS) [28], and university-based demographic surveillance sites are the

main sources of data for research despite limited availability of data. Individual researchers and organizational data archival system are poor. Open grant opportunities are small and most of the researches are funded by the government, but this source does not suffice [24]. Universities have not been tracking published researches. Furthermore, many studies are still published in non–peer reviewed and low-impact journals and/or by predatory publishers. Moreover, the quantity and quality of reviews are not yet known.

To our knowledge, there is no overview of narrative and systematic reviews in Ethiopia. Therefore, we aimed to (1) assess the trend of narrative and systematic reviews in Ethiopia, (2) examine the methodological quality using standardized quality appraisal tools, and (3) provide future directions for researchers, research institutes, and health care policymakers.

2. Methods

2.1. Inclusion and exclusion criteria

All biomedical and public health narrative reviews and systematic reviews with or without meta-analyses on topics associated with Ethiopia irrespective of the place of publication and authors' affiliation were included. Moreover, all studies published until April 2018 were included. Publication types, whether narrative reviews or systematic reviews with or without meta-analyses, were identified based on authors' report [29]. Exclusion criteria were any one of the following: (1) systematic review protocols, (2) both quantitative and qualitative primary studies, (3) regional and international reviews and/or meta-analysis, (4) case reports, case series, commentaries, anonymous reports, duplicate studies, and editorials, (5) published in non-English language, (6) articles without full text, (7) review and meta-analysis in nonhuman subjects, and (8) literature reviews following case report. The full texts of all eligible articles were obtained for data extraction.

2.2. Searching strategy

PubMed, EMBASE, Web of Science, SCOPUS, CINAHL, WHO Global Index Medicus, Cochrane Library, and PsycINFO electronic databases were searched to retrieve all published narrative reviews, systematic reviews, and/or meta-analyses. We searched for articles that included any combination of the following search terms in their singular or plural form in their title, abstract, keywords, and text: "narrative review," "historic review," "review," "systematic review," "meta-analysis," "pooled analysis," "Ethiopia," and "Ethiop*." "AND" and "OR" Boolean operators were used to combine terms and develop the search syntax. Search syntax was developed for each database as shown in Supplementary file 1 (Table S1). Depending on the indexed term in each database, all search terms might not be used in each database syntax. We have also hand-searched the table of contents of Ethiopian Journal of Health Development (1984–2018) (http://www.ejhd.org/index.php/ejhd/index), Ethiopian Journal of Health Science (1990–2018) (https://www.ju.edu.et/ejhs/), Addis Continental Institute of public health library (2006–2018) (http://www.addiscontinental.edu.et/), Ethiopian Journal of Reproductive Health (http://ejrh.org/index.php/ejrh), and Google Scholar. Furthermore, we manually searched gray literature and cross-references of included studies.

2.3. Data extraction and quality appraisal

From included studies, the following data were extracted: name of the first author, publication year, number of authors, major topic area, publication type (i.e., narrative review, systematic review, systematic review with meta-analysis), publisher, country of publication, volume of journal, affiliation of authors, number of primary studies included, number of databases searched, study design of included studies, quality assessment tool used to assess primary studies, funding (i.e., funded, not funded/nondeclared), years of coverage of primary studies search, and protocol registration and/or publication. Affiliation represents the institutional address of all authors when the research was done and categorized as Ethiopian institutions, foreign institutions, or both. Whenever difficult to identify publishers and place of publication, the journal web pages were referred. The topic area was defined based on the main outcome variable. The methodological quality was assessed by two trained reviewers (S.M.A. and B.S.T.) using the International Narrative Systematic Assessment (INSA) [30] for narrative reviews and A MeaSurement Tool to Assess Systematic Reviews (AMSTAR-2) [31] for systematic reviews with or without meta-analyses. INSA has seven items which can be rated as "yes" or "no" [Supplementary file 2 (Table S1)]. One point was given for each of the following criteria: clarity of background, objective, conclusion, and description of selection of studies, study characteristics, result, and conflict of interest. A review with a total INSA score of ≥5 points was considered "good" quality review and "poor" otherwise [30]. INSA is a valid quality assessment tool for narrative reviews [30]. AMSTAR-2 has 16 items that include various aspects of systematic review and/or meta-analysis [Supplementary file 2 (Table S2)]. The overall quality of a systematic review and/or meta-analysis was rated as "high," "moderate," "low," and "critically low" [31]. The rating criteria and interpretation have been published elsewhere [31].

2.4. Statistical analysis

The data were first analyzed descriptively using frequencies and percentages. Fisher's exact test was used to investigate the association between methodological quality

of reviews and funding, authors affiliation, number of databases searched to access primary studies, number of primary studies included, years of coverage to search primary studies, publisher, and place of publication. All data entry and analyses were carried out using Statistical Package for the Social Sciences (SPSS) version 23 [32].

3. Results

3.1. Search results

Totally, 2,201 articles were obtained from searching PubMed ($n = 806$), EMBASE ($n = 273$), Web of Science ($n = 215$), SCOPUS ($n = 204$), CINAHL ($n = 36$), WHO Global Index Medicus ($n = 624$), Cochrane library ($n = 4$), and hand-searching of table of contents of journals, and Google Scholar ($n = 39$). We could not find any article from PsycINFO. After removing duplicate articles ($n = 940$), reviews and meta-analyses on nonhuman subjects ($n = 73$) and non-English articles ($n = 31$), 1,156 articles were ready for title and abstract screening. Of these, 1,050 articles were excluded for various reasons: 718 were regional and international (systematic) reviews and/or meta-analyses, 311 were nonrelated titles/case reports, 10 were primary studies, and 11 were protocols. Consequently, 106 articles were selected for full-text review. Eleven reviews were excluded from quality evaluation due to the absence of full text after exhaustively searching table of contents of the journals and digital archives, and contacting the corresponding authors; we extracted background characteristics of these reviews. Finally, the quality of 95 articles (47 narrative reviews and 48 systematic reviews with or without meta-analyses) was appraised. The PRISMA flow diagram of screening and selection process is shown in Fig. 1.

3.2. Background characteristics

Of 106 selected articles published from 1970 to 2018, 54 (50.9%) were narrative reviews, 17 (16%) were systematic reviews, and 35 (33.1%) were systematic reviews with meta-analyses. Likewise, 31 (29.2%) were published in Ethiopian journals (e.g., Ethiopian Health Development Journal and Ethiopian Medical Journal), 38 (40%) searched three to four databases (i.e., PubMed is the most searched), and 31 (32.6%) included 5 to 19 studies. We found only one Cochrane review based on a randomized control trial and only five systematic reviews with meta-analyses have registered their protocol. Overall, the publication rates of reviews have risen in Ethiopia. The number of systematic reviews with or without meta-analyses being published between 2016 and 2018 was four times higher than the publication rates between 2011 and 2015. The publication rate of narrative reviews decreased after 2011, whereas systematic review publication rate remained stable.

Supplementary file 2 (Table S2) shows the summary of background characteristics of included reviews.

3.3. Methodological quality of narrative reviews

As presented in Supplementary file 1 (Table S3), only seven (14.9%) narrative reviews clearly described the characteristics of included studies, 17 (36.2%) reported conflict of interest, and 18 (38.3%) described the selection of studies. Overall, 26 (55.3%) narrative reviews had poor quality.

3.4. Methodological quality of systematic reviews with or without meta-analysis

As shown in Supplementary file 1 (Table S4), only five (10.4%) systematic reviews were registered their protocol, four (8.3%) justified the selection of the study design for inclusion, and none of them reported sources of funding for the primary studies. Overall, four (8.3%) systematic reviews had high quality, eight (16.7%) had low quality, and 36 (75%) had critically low quality.

3.5. Factors affecting quality of reviews

Methodological quality of narrative reviews differed significantly by journal volume, number of primary studies included, and number of databases searched, whereas the quality of systematic reviews with or without meta-analyses differed by use of quality assessment tools (Table 1).

4. Discussion

This overview, which is the first of its type in Ethiopia, aimed to synthesize evidence on narrative reviews and systematic reviews with or without meta-analyses. There has been an increasing publication rate of reviews where most published in the last decade were based on basic researches. Half of the narrative reviews and three-quarters of the systematic reviews had poor methodological quality, which diminishes the trustworthiness, accuracy, and comprehensiveness of newly generated evidence. We also uncovered that the methodological quality of narrative reviews differed by journal volume, number of primary studies included, and number of databases searched, whereas the quality of systematic reviews differed by use of standardized methodological quality assessment tool.

Overall, there has been an increasing publication rate of (systematic) reviews. This might be due to an expansion of higher education institutions, use of publication for academic career promotion and other incentives, increment of publication rates of primary studies, increased budget allocation for research, opportunity for open access waiver fund by publishers, and increased collaboration of researchers. Since 2011, the publication rates of systematic
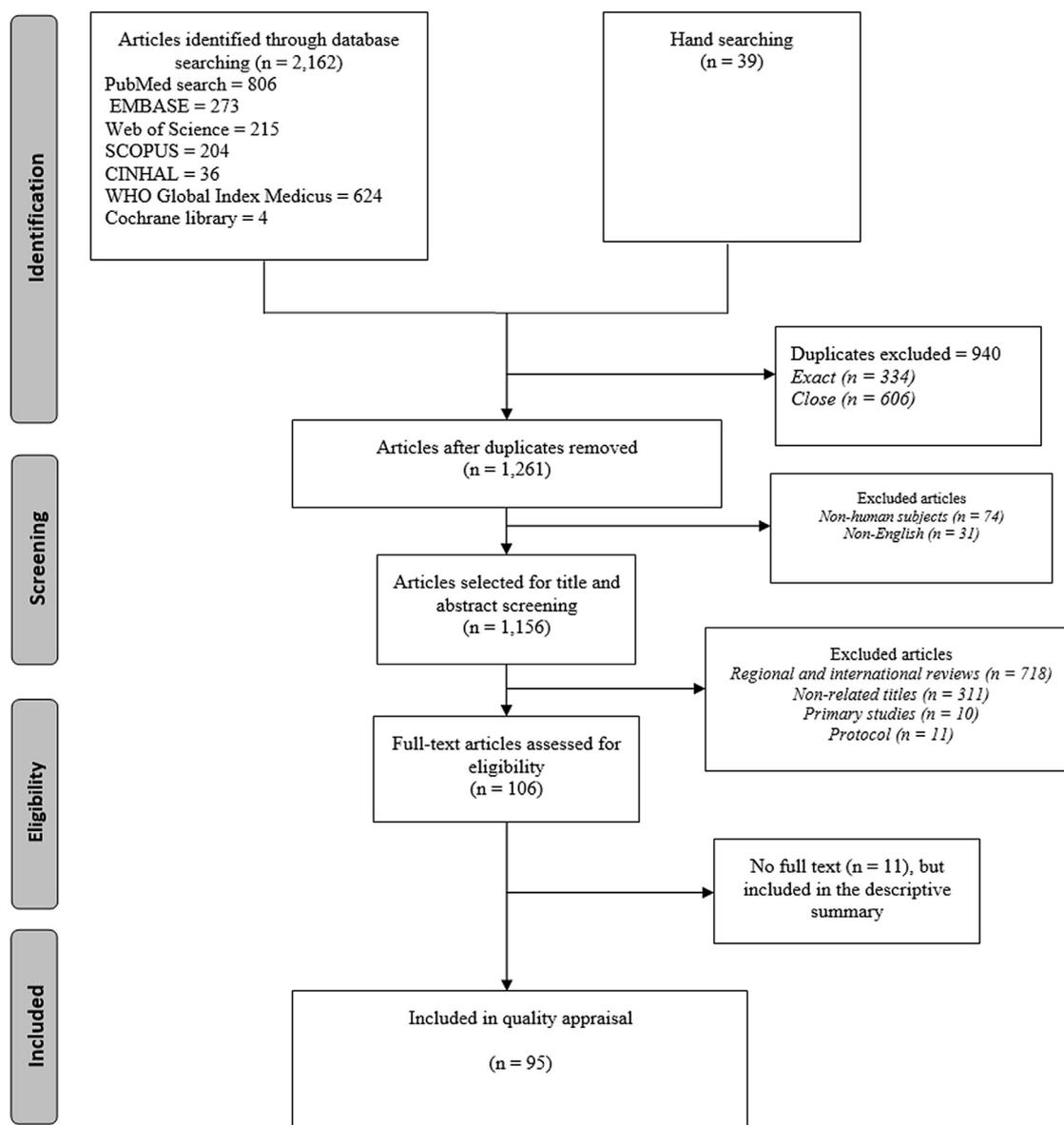
Fig. 1. Schematic presentation of literature screening and selection process.

reviews with or without meta-analyses in Ethiopia have risen by fourfold, whereas narrative reviews decreased by half. This change in publication trend might be due to methodological advancement and increased authors' knowledge about statistical techniques to do a meta-analysis [9].

This overview revealed that almost all narrative and systematic reviews are based on observational studies, and 55.3% of narrative reviews and 75% of systematic reviews with or without meta-analysis had poor scientific methodological quality. Our finding is in agreement with previous overview reports in biomedical and public health outcomes, whereby the methodological quality of reviews is not as high as the publication rate [33−36]. This could be attributed to conducting and reporting systematic reviews and meta-analyses without registering a study protocol and

publishing in low-impact journals, which are less likely to request the registration of protocol; consequently, authors may be biased. This hypothesis is supported by our findings, which shows only four systematic reviews with or without meta-analyses have registered their protocol in the International Prospective Register of Systematic Reviews (PROSPERO). In 2016, two-thirds of published protocols have been registered in PROSPERO [37]; systematic reviews with registered protocols have high quality compared with reviews without registered protocols [38]. Another possible explanation is that authors may not be aware of the quality criteria, given that most tools are recently invented [17,30,39−41]. Inadequate quality assessment of included primary studies using a standardized tool may also explain low quality of reviews [18]. For example, only one-fourth of the reviews assessed the

Table 1. Differences in methodological quality of narrative reviews and systematic review with or without meta-analyses

Characteristics	Category	Quality of narrative review			Quality of systematic review			
		Poor	Good	*P*-value	High	Low	Critically low	*P*-value
Publication year[a]	1970—2011	11	4	0.14	-	-	-	0.25
	2011—2015	9	13		0	1	13	
	2016—2018	6	4		4	7	23	
Number of authors	One	7	3	0.25	0	1	11	0.09
	2—3	12	7		0	2	14	
	≥4	7	11		4	5	11	
Topic area	HIV/AIDS	3	2	0.19	2	1	1	0.15
	Nutrition	3	0		0	1	5	
	TB	0	2		0	0	3	
	Others[b]	20	17		2	6	27	
Publisher	EPHA	9	3	0.12	0	0	3	0.08
	EMA	2	0		-	-	-	
	BioMed Central	0	2		0	3	18	
	Jimma University	2	4		0	1	0	
	Hindawi	0	1		2	0	3	
	Others	13	11		2	4	12	
Place of publication	Ethiopia	13	7	0.67	0	1	3	0.27
	England	4	3		0	4	18	
	United States	4	5		3	2	7	
	Others	5	6		1	1	8	
Journal volume	≤11	4	8	0.02	0	1	12	0.45
	12—18	1	4		3	5	13	
	≥19	21	9		1	2	11	
Authors' affiliation(s)	Both	4	6	0.45	2	2	3	0.09
	Foreign country	17	10		0	2	5	
	Ethiopia	5	5		2	4	28	
Source databases access (systematic) review and meta-analysis	EMBASE	1	0	0.42	0	1	4	0.81
	Google Scholar	11	5		3	3	9	
	PubMed	13	14		1	4	18	
	SCOPUS	1	2		0	0	3	
	Web of Science	-	-		0	0	2	
Number of primary studies included[c]	5—19	0	8	0.001	3	3	17	0.66
	20—432	4	2		1	5	18	
	Not reported	22	11		0	0	1	
Number of databases searched[c]	1—2	0	5	<0.001	1	1	11	0.11
	3—4	4	10		0	6	18	
	5—11	2	3		3	1	6	
	Not reported	20	3		0	0	1	
Funding[c]	Funded	7	9	0.36	0	0	4	0.99
	Not funded/Nondeclared	19	12		4	8	32	
Years of coverage of primary studies search[c]	2—15	1	2	0.08	4	5	11	0.08
	15.1—72.33	3	7		0	1	12	
	Not reported	22	12		0	2	13	

(Continued)

Table 1. Continued

Characteristics	Category	Quality of narrative review			Quality of systematic review			
		Poor	Good	*P*-value	High	Low	Critically low	*P*-value
Tools used to assess methodological quality[c]	Standardized tool[d]				0	0	26	<0.001
	Not reported				4	8	10	

Abbreviations: EPHA, Ethiopian Public Health Association; EMA, Ethiopian Medical Association.
[a] The cutoffs were arbitrarily chosen.
[b] At least one publication in various topics.
[c] Total number of articles is 95.
[d] Critical Appraisal for Research, Downs and Black checklists, Evers Checklist, Health states Quality scale, Jadad scale, STrengthening the Reporting of OBservational studies in Epidemiology (STROBE) statement, Joanna Briggs Institute scale, Meta-Analysis of Statistics Assessment and Review Instrument (MAStARI) and Newcastle-Ottawa Scale (NOS).

methodological quality of primary studies using a standardized tool, such as Joanna Briggs Institute (JBI) critical appraisal tools, Downs and Black checklists, Evers Checklist, Jadad scale, STROBE statement, MAStARI, and NOS. In addition, peer reviewers, editors, and authors may not be fully aware of meta-analysis methodological approaches and can be unqualified to address statistical issues [9]. Involving only one reviewer to screen studies, conducting the review without adequate expertise or consulting experts, including a small number of studies and faster completion with poorer reporting quality could be possible reasons [42]. Furthermore, lack of well-established and harmonized criteria for academic carrier promotion and incentivization leads researchers to focus only on the number of publication instead of ensuring the quality of reviews.

Establishment of sustainable and large financial sources for research with a special emphasis on clinical and applied research, strengthening the newly established research councils, training authors, professional methodologists, editors and reviewers, supporting professional associations and using experience of Ethiopian diaspora professionals are important to improve the number and quality of biomedical and public health reviews and overviews in Ethiopia [9,18,25]. Although there was no quality difference, in our overview, only one of five narrative and systematic reviews are funded. Among others, description of characteristics of included studies, reporting of conflict of interest, description of selection of studies, protocol registration, justifying selection of the study designs for inclusion, and reporting sources of funding for the primary studies are least implemented components of a review. Furthermore, establishment of a new national library repositories and strengthening the existing ones, continuing research career promotion and increasing incentives provided to researchers based on impartial, harmonized, and evidence-based criteria, increasing the number of local journals and ensuring their peer-review quality and increasing the number of research sites, for example, increasing Demographic Surveillance Systems would be very important strategies to ensure output and quality of reviews [23]. Finally, it is helpful to promote development and uptake of narrative reviews and systematic reviews

with or without meta-analyses through informing the importance for health care policymakers, increasing access to the international journals, giving priority and support for systematic reviews, increasing competency and willingness of researchers to conduct reviews, creating awareness about importance for end users, and improving the quality, visibility, and accessibility of local primary research [18,43].

In this overview, we summarized evidence from reviews and meta-analyses and evaluated the methodological qualities using a standardized tool. Because this is the first overview of its kind, it also provides an insight into the trend of narrative and systematic reviews and the level of quality of evidence generated in Ethiopia. The difference in scientific methodological quality has been compared in terms of several factors. Our overview is the most comprehensive overview by including all reviews and meta-analyses published so far in biomedical and public health discipline in Ethiopia and provides a nationally representative evidence. We assessed and reported the quality of narrative reviews for the first time using a standardized tool. It is also relevant to acknowledge the limitation of this overview. INSA is the only quality assessment tool for narrative reviews, which is broad that can lead to subjective bias. Despite the popularity of AMSTAR, it is also relevant to admit that the revised AMSTAR-2 tool was not validated [31]. Given the limited number of reviews, only a few public health and biomedical topics were addressed; as a result, topic-based in-depth analysis was not carried out, and it may be difficult to translate the result to a particular health care intervention or outcome. We could also not ascertain a strong association due to small sample size and results should be interpreted with caution. Furthermore, the exclusion of non-English articles and articles without full-text would affect the results if they were found to be of good quality.

4.1. Conclusions and future directions

Publication rate of narrative reviews and systematic reviews with or without meta-analysis has risen, but on the other hand, half of the reviews and three-quarters of the systematic reviews had poor methodological quality. Given

that developing countries share common problems, other low- and middle-income countries should also assess the publication rate and evaluate the scientific methodological quality of narrative and systematic reviews, identify country-specific gaps, and provide problem-centered interventions. Most narrative and systematic reviews are epidemiologic reviews focusing on prevalence and associated factors; hence, reviews based on diagnostic, prognostic, and therapeutic research are needed. Although many quality appraisal tools are available for systematic reviews with or without meta-analysis, more objective and detailed assessment tool is required for narrative reviews. Further investigation is also required to identify the facilitators and barriers of uptake and quality of narrative and systematic reviews. Despite the low methodological rigor, almost all systematic reviews and meta-analysis followed the PRISMA statement. We would also recommend authors to strictly follow standardized quality assessment tools during conducting and reporting (systematic) reviews with or without a meta-analysis [17,44].

CRediT authorship contribution statement

Tesfa Dejenie Habtewold: Conceptualization, Data curation, Formal analysis, Investigation, Methodology, Project administration, Resources, Software, Writing - original draft, Writing - review & editing. **Sisay Mulugeta Alemu:** Validation, Visualization, Writing - original draft, Resources, Writing - review & editing. **Shimels Hussien Mohammed:** Writing - original draft, Writing - review & editing. **Aklilu Endalamaw:** Writing - original draft, Writing - review & editing. **Mohammed Akibu Mohammed:** Writing - original draft, Writing - review & editing. **Andreas A. Teferra:** Writing - original draft, Writing - review & editing. **Abera Kenay Tura:** Writing - original draft, Writing - review & editing. **Nigus Gebremedhin Asefa:** Validation, Visualization, Writing - original draft, Writing - review & editing. **Balewgizie Sileshi Tegegne:** Investigation, Methodology, Project administration, Resources, Software, Supervision, Validation, Visualization, Writing - original draft, Writing - review & editing.

Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.jclinepi.2019.01.011.

References

[1] Altman DG. Poor-quality medical research: what can journals do? JAMA 2002;287:2765—7.

[2] Çaparlar CÖ, Dönmez A. What is scientific research and how can it be done? Turkish J Anaesthesiol Reanim 2016;44(4):212.

[3] US National Library of Medicine. 2016 key MEDLINE indicators 2016. Available at https://www.nlm.nih.gov/bsd/bsd_key.html. Accessed December 29, 2017.

[4] Gopalakrishnan S, Ganeshkumar P. Systematic reviews and meta-analysis: understanding the best evidence in primary healthcare. J Fam Med Prim Care 2013;2(1):9—14.

[5] Sterne JA, Egger M, Smith GD. Investigating and dealing with publication and other biases. In: Systematic reviews in health care: meta-analysis in context. 2nd ed. London: BMJ Books; 2001:189—208.

[6] Mulimani PS. Evidence-based practice and the evidence pyramid: a 21st century orthodontic odyssey. Am J Orthod Dentofacial Orthop 2017;152(1):1—8.

[7] Petticrew M. Systematic reviews from astronomy to zoology: myths and misconceptions. BMJ 2001;322:98—101.

[8] Page MJ, Shamseer L, Altman DG, Tetzlaff J, Sampson M, Tricco AC, et al. Epidemiology and reporting characteristics of systematic reviews of biomedical research: a cross-sectional study. PLoS Med 2016;13(5):e1002028.

[9] Gurevitch J, Koricheva J, Nakagawa S, Stewart G. Meta-analysis and the science of research synthesis. Nature 2018;555:175.

[10] Askie L, Offringa M. Systematic reviews and meta-analysis. Semin Fetal Neonatal Med 2015;20(6):403—9.

[11] McManus RJ, Wilson S, Delaney BC, Fitzmaurice DA, Hyde CJ, Tobias RS, et al. Review of the usefulness of contacting other experts when conducting a literature search for systematic reviews. BMJ 1998;317:1562—3.

[12] Smith V, Devane D, Begley CM, Clarke M. Methodology in conducting a systematic review of systematic reviews of healthcare interventions. BMC Med Res Methodol 2011;11:15.

[13] Bown M, Sutton A. Quality control in systematic reviews and meta-analyses. Eur J Vasc Endovasc Surg 2010;40(5):669—77.

[14] Silva V, Grande AJ, Martimbianco ALC, Riera R, Carvalho APV. Overview of systematic reviews-a new type of study: Part I: why and for whom? Sao Paulo Med J 2012;130(6):398—404.

[15] Silva V, Grande AJ, Carvalho AP, Martimbianco ALC, Riera R. Overview of systematic reviews-a new type of study. Part II. Sao Paulo Med J 2015;133(3):206—17.

[16] Hartling L, Chisholm A, Thomson D, Dryden DM. A descriptive analysis of overviews of reviews published between 2000 and 2011. PLoS One 2012;7:e49667.

[17] Pussegoda K, Turner L, Garritty C, Mayhew A, Skidmore B, Stevens A, et al. Identifying approaches for assessing methodological and reporting quality of systematic reviews: a descriptive study. Syst Rev 2017;6(1):117.

[18] Yousefi-Nooraie R, Rashidian A, Nedjat S, Majdzadeh R, Mortaz-Hedjri S, Etemadi A, et al. Promoting development and use of systematic reviews in a developing country. J Eval Clin Pract 2009;15:1029—34.

[19] Kirigia JM, Wambebe C. Status of national health research systems in ten countries of the WHO african region. BMC Health Serv Res 2006;6:135.

[20] Kirigia JM, Ota MO, Motari M, Bataringaya JE, Mouhouelo P. National health research systems in the WHO african region: current status and the way forward. Health Res Policy Syst 2015;13(1):61.

[21] Canadian Coalition for Global Health Research (CCGHR). Ethiopia research environment 2017. Available at http://www.ccghr.ca/resources/harmonization/ethiopia/ethiopia-research-environment/. Accessed December 30, 2017.

[22] UNESCO. Global open access portal: Ethiopia 2017. Available at http://www.unesco.org/new/en/communication-and-information/portals-and-platforms/goap/access-by-region/africa/ethiopia/. Accessed October 2, 2018.

[23] Gaym A. Health research in Ethiopia—past, present and suggestions on the way forward. Ethiop Med J 2008;46(3):287—308.

[24] World Health Organization. African health observatory: health information, research, evidence and knowledge in Ethiopia 2014. Available at http://www.aho.afro.who.int/profiles_information/index.php/Ethiopia:Research_-_Health_information,_research,_evidence_and_knowledge. Accessed December 30, 2017.

[25] Tesfa B. Challenges of ethiopian researchers and potential mitigation with ethiopian science, technology and innovation policy 2015.

Available at http://eprints.hud.ac.uk/id/eprint/27118/. Accessed December 30, 2017.

[26] Berhane Y, Wall S, Kebede D, Emmelin A, Enquselassie F. Establishing an epidemiological field laboratory in rural areas - potentials for public health research and interventions: The Butajira Rural Health Programme 1987-1999. Ethiop J Health Dev 2000;Supp:1–47.

[27] INDEPTH Network. Butajira Health and Demographic Surveillance System 2013. Available at http://www.indepth-network.org/Profiles/butajira_hdss_2013.pdf. Accessed October 2, 2018.

[28] CSA I. Ethiopia demographic and health survey 2011. In: Addis Ababa, Ethiopia and Calverton. Maryland, USA: Central Statistical Agency and ICF International; 2012:430.

[29] Moher D, Liberati A, Tetzlaff J, Altman DG, Prisma Group. Preferred reporting items for systematic reviews and meta-analyses: the PRISMA statement. PLoS Med 2009;6(7):e1000097.

[30] La Torre G, Backhaus I, Mannocci A. Rating for narrative reviews: concept and development of the international narrative systematic assessment tool. Senses Sci 2015;2(2):31–5.

[31] Shea BJ, Reeves BC, Wells G, Thuku M, Hamel C, Moran J, et al. AMSTAR 2: a critical appraisal tool for systematic reviews that include randomised or non-randomised studies of healthcare interventions, or both. BMJ 2017;358:j4008.

[32] IBM Corporation. IBM SPSS statistics for windows, Version 23.0. Armonk, NY: IBM; 2011.

[33] Shin I. Recent research trends in meta-analysis. Asian Nurs Res (Korean Soc Nurs Sci) 2017;11(2):79–83.

[34] Cullis PS, Gudlaugsdottir K, Andrews J. A systematic review of the quality of conduct and reporting of systematic reviews and meta-analyses in paediatric surgery. PLoS One 2017;12:e0175213.

[35] Zhu Y, Fan L, Zhang H, Wang M, Mei X, Hou J, et al. Is the best evidence good enough: quality assessment and factor analysis of meta-analyses on depression. PLoS One 2016;11:e0157808.

[36] Gómez-García F, Ruano J, Gay-Mimbrera J, Aguilar-Luque M, Sanz-Cabanillas JL, Alcalde-Mellado P, et al. Most systematic reviews of high methodological quality on psoriasis interventions are classified as high risk of bias using ROBIS tool. J Clin Epidemiol 2017;92:79–88.

[37] Allers K, Hoffmann F, Mathes T, Pieper D. Systematic reviews with published protocols compared to those without: more effort, older search. J Clin Epidemiol 2018;95:102–10.

[38] Sideri S, Papageorgiou SN, Eliades T. Registration in PROSPERO of systematic review protocols was associated with increased review quality. J Clin Epidemiol 2018;100:103–10.

[39] Booth A, Clarke M, Dooley G, Ghersi D, Moher D, Petticrew M, et al. PROSPERO at one year: an evaluation of its utility. Syst Rev 2013;2(1):4.

[40] Booth A, Clarke M, Dooley G, Ghersi D, Moher D, Petticrew M, et al. The nuts and bolts of PROSPERO: an international prospective register of systematic reviews. Syst Rev 2012;1(1):2.

[41] Shea BJ, Grimshaw JM, Wells GA, Boers M, Andersson N, Hamel C, et al. Development of AMSTAR: a measurement tool to assess the methodological quality of systematic reviews. BMC Med Res Methodol 2007;7:10.

[42] Reynen E, Robson R, Ivory J, Hwee J, Straus SE, Pham B, et al. A retrospective comparison of systematic reviews with same-topic rapid reviews. J Clin Epidemiol 2018;96:23–34.

[43] Wallace J, Byrne C, Clarke M. Making evidence more wanted: a systematic review of facilitators to enhance the uptake of evidence from systematic reviews and meta analyses. Int J Evid Based Healthc 2012;10(4):338–46.

[44] Diekemper RL, Ireland BK, Merz LR. Development of the documentation and appraisal review tool for systematic reviews. World J Meta Anal 2015;3:142–50.